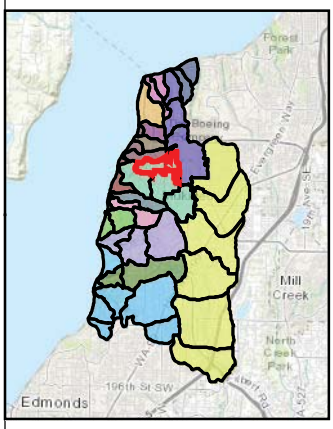
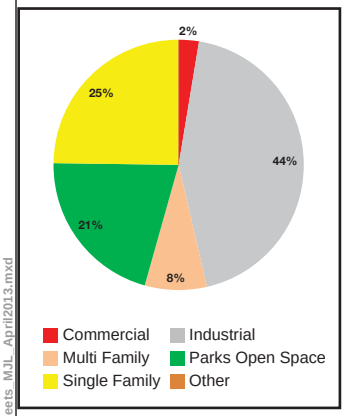
Big Gulch North

Watershed: Big Gulch
Management Category: Targeted Management Strategies
Priority: High

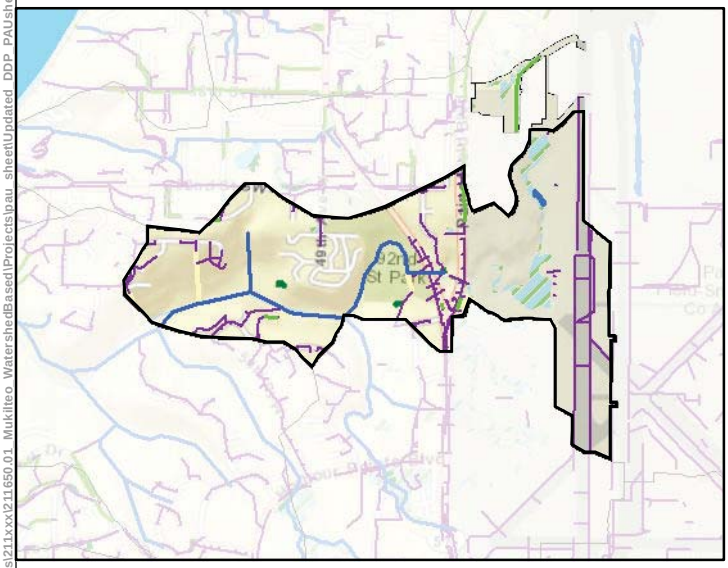


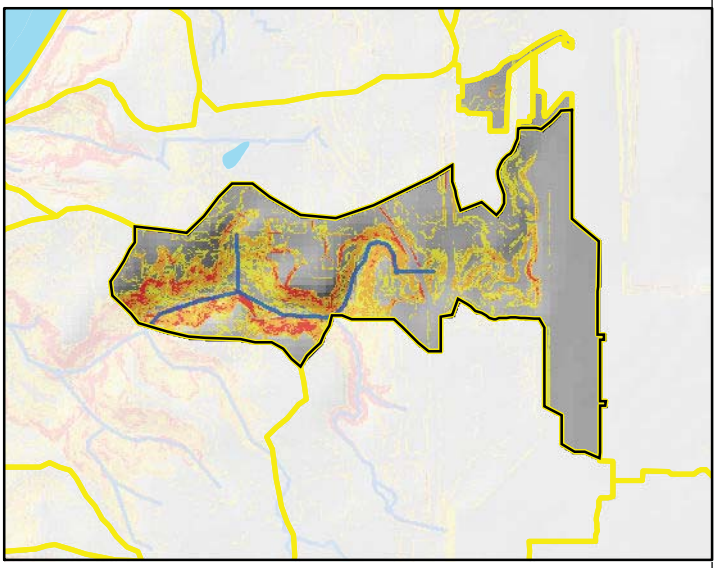
Area (acres): 303
% Impervious: 23%
% Wetland: 0.8%
Landscape Position: Plateau



Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 Feet





Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Big Gulch North

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	high

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES[1]	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

[1]*Recommended strategies, such as disconnect downspouts, may not be appropriate for larger sites such as schools, or in locations where runoff would be directed to adjacent private property.*

Constraints/Existing Land Use

A portion of Paine Field is located in the upper portion of this PAU; this may limit the use of strategies that infiltrate stormwater due to risks associated with spills.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

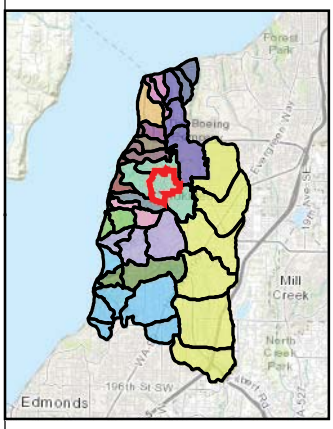
There are no known problems in this PAU.

Known Opportunities

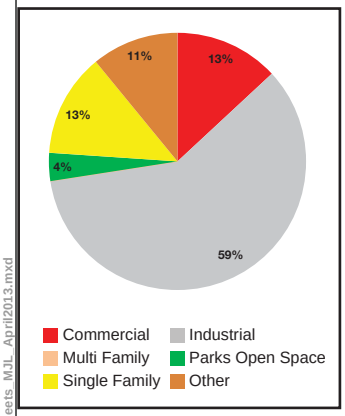
The CAMP report identified two regional mitigation sites within this PAU: M4 and M7; in addition, 21% of this PAU is in parks and open space, which may provide additional opportunities.

Big Gulch South

Watershed: Big Gulch
Management Category: Targeted Management Strategies
Priority: High

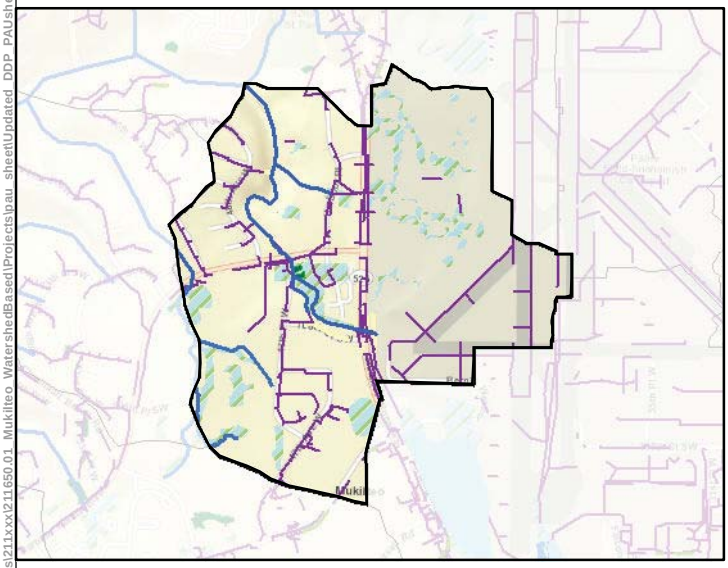


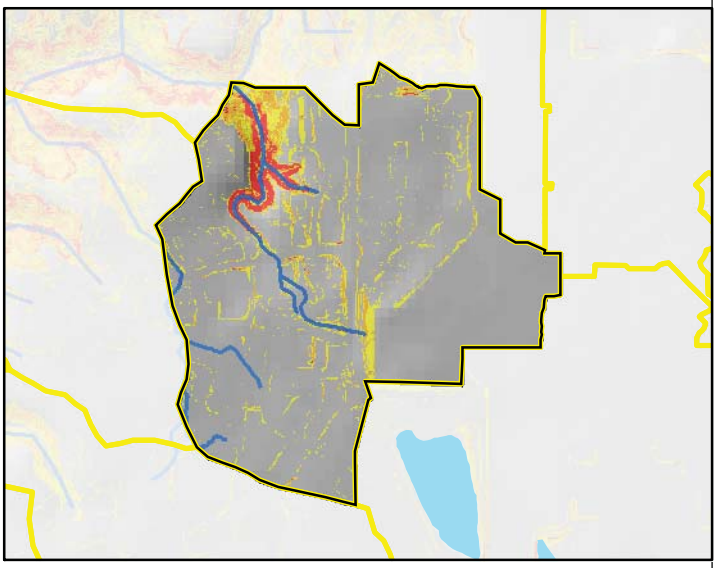
Area (acres): 419
% Impervious: 41%
% Wetland: 4.4%
Landscape Position: Plateau



Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Big Gulch South

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	high

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

***Bold font** indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

A portion of Paine Field is located in the upper portion of this PAU; this may limit the use of strategies that infiltrate stormwater due to risks associated with spills.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

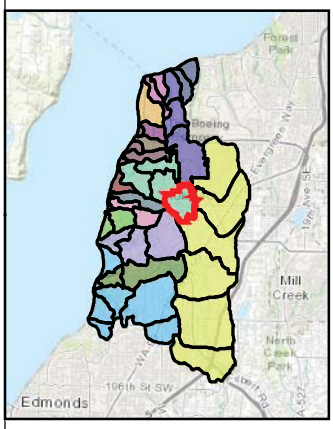
There are no known problems in this PAU.

Known Opportunities

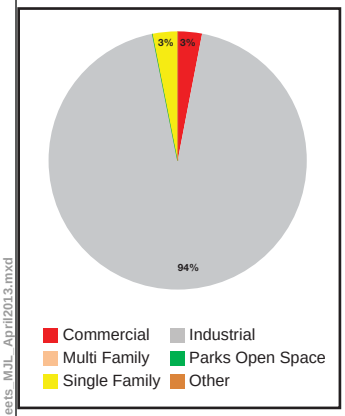
The CAMP report identified one regional mitigation sites within this PAU: M6.

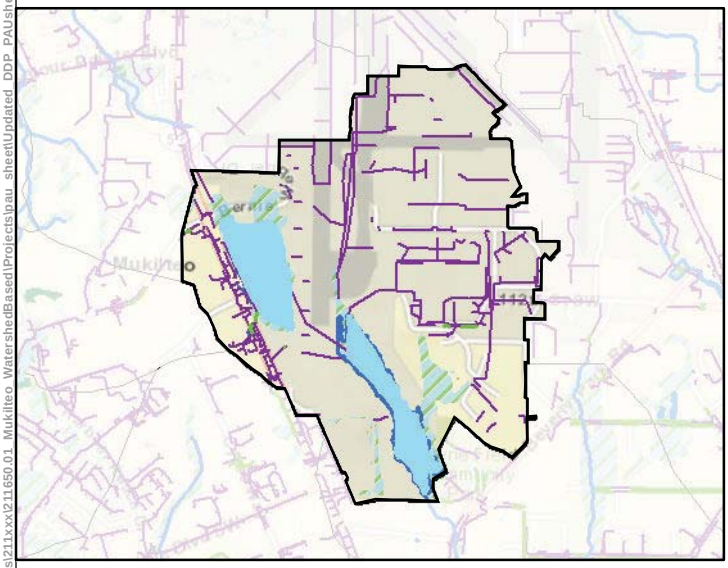
Big Gulch SE

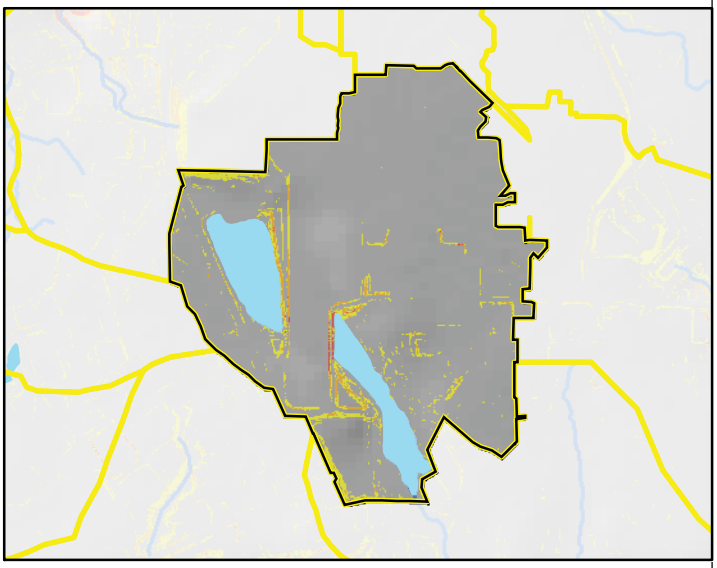
Watershed: Big Gulch
Management Category: Targeted Management Strategies
Priority: High



Area (acres): 463
% Impervious: 50%
% Wetland: 10.3%
Landscape Position: Plateau







Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Big Gulch Southeast

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes are impaired.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has over 50% TIA and approximately 94 percent of the area designated for industrial use, which may limit infiltration.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

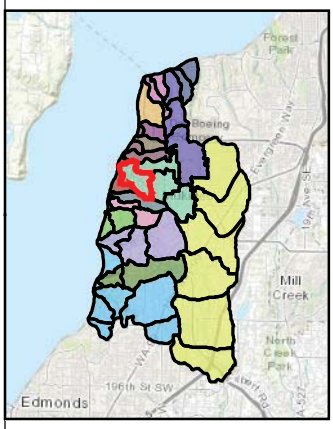
There are no known problems in this PAU.

Known Opportunities

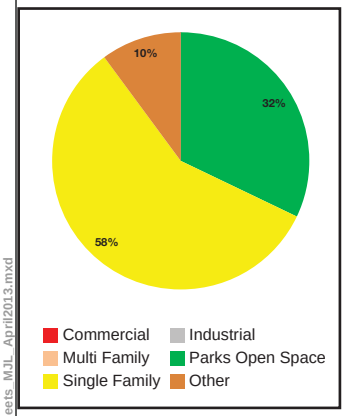
There are no known existing opportunities in this PAU.

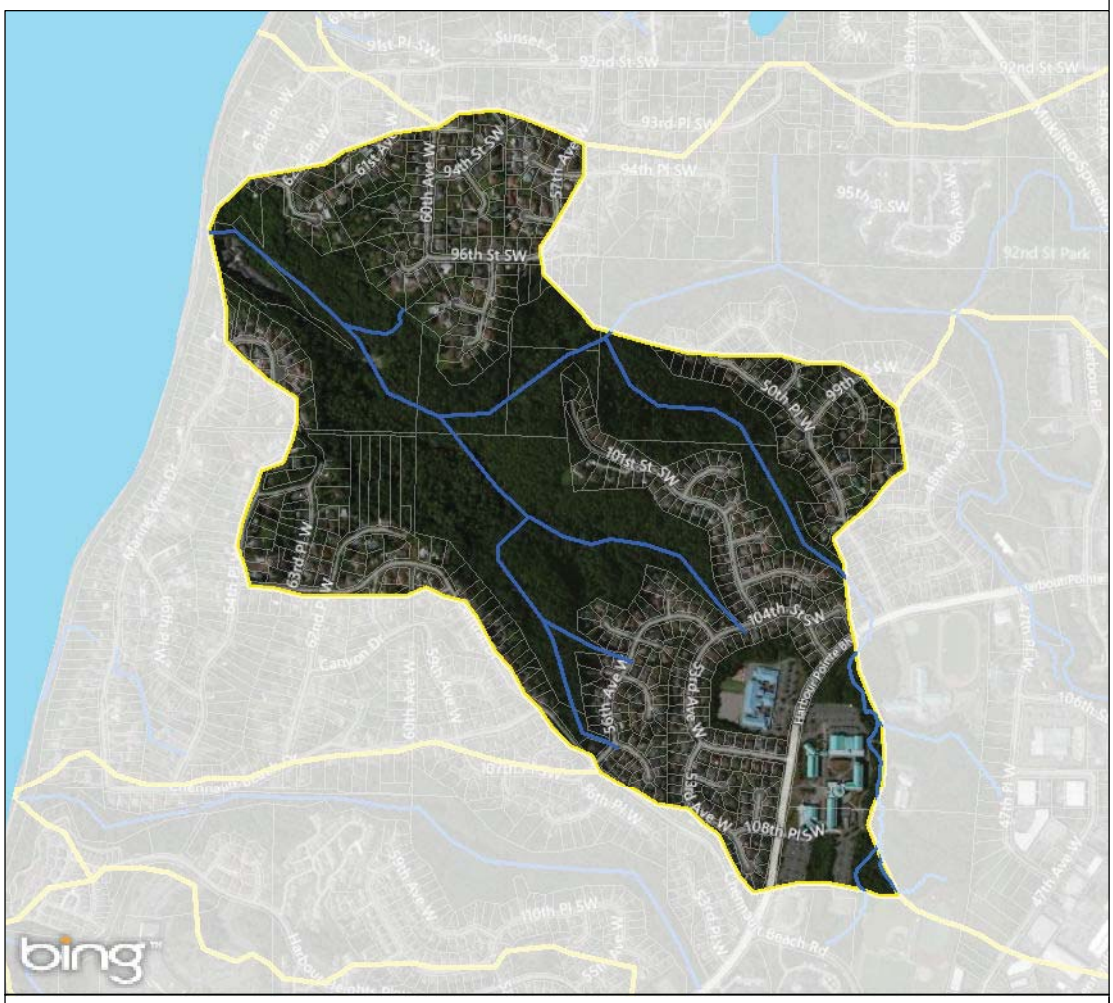
Big Gulch West

Watershed: Big Gulch
Management Category: Targeted Management Strategies
Priority: Moderate



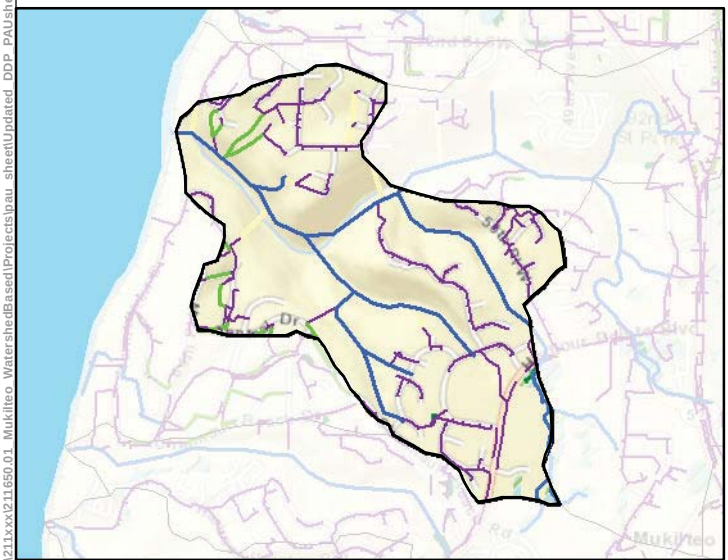
Area (acres): 365
% Impervious: 26%
% Wetland: 0.7%
Landscape Position: Ravine

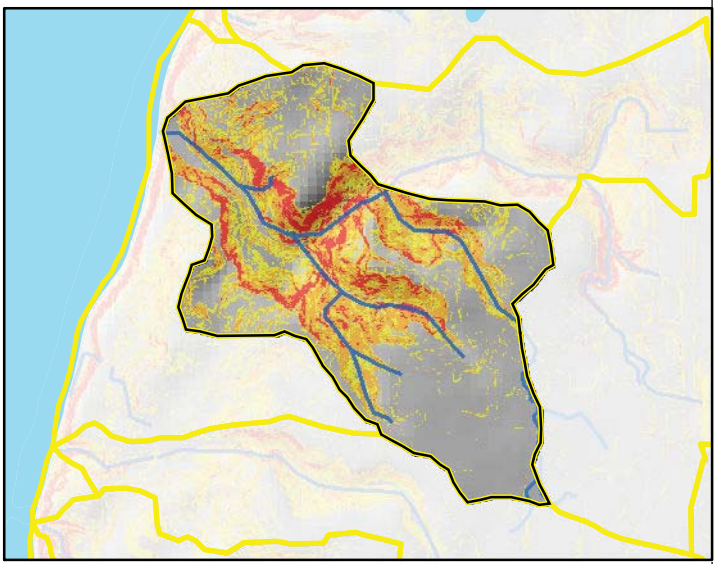




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Big Gulch West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

Much of the land in this PAU is located in a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/ prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

There are two known problems in this PAU:

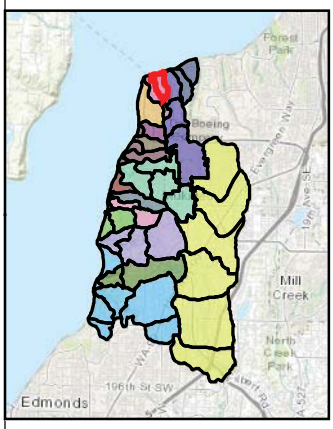
1. There is the potential for excessive erosion in the lower 0.5 miles of stream channel downstream of the high flow by-pass pipe.
2. Low area near 63rd/64th Pl W is getting wetter due to increasing vegetation and loss of storage capacity.

Known Opportunities

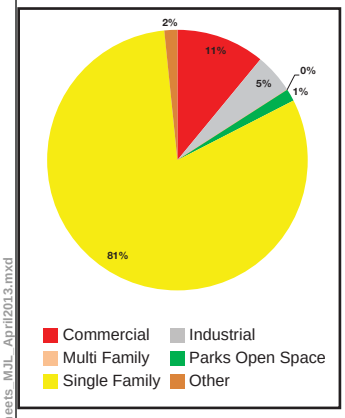
There are no known existing opportunities in this PAU.; however, 32% of this PAU is in parks and open space, which may provide opportunities.

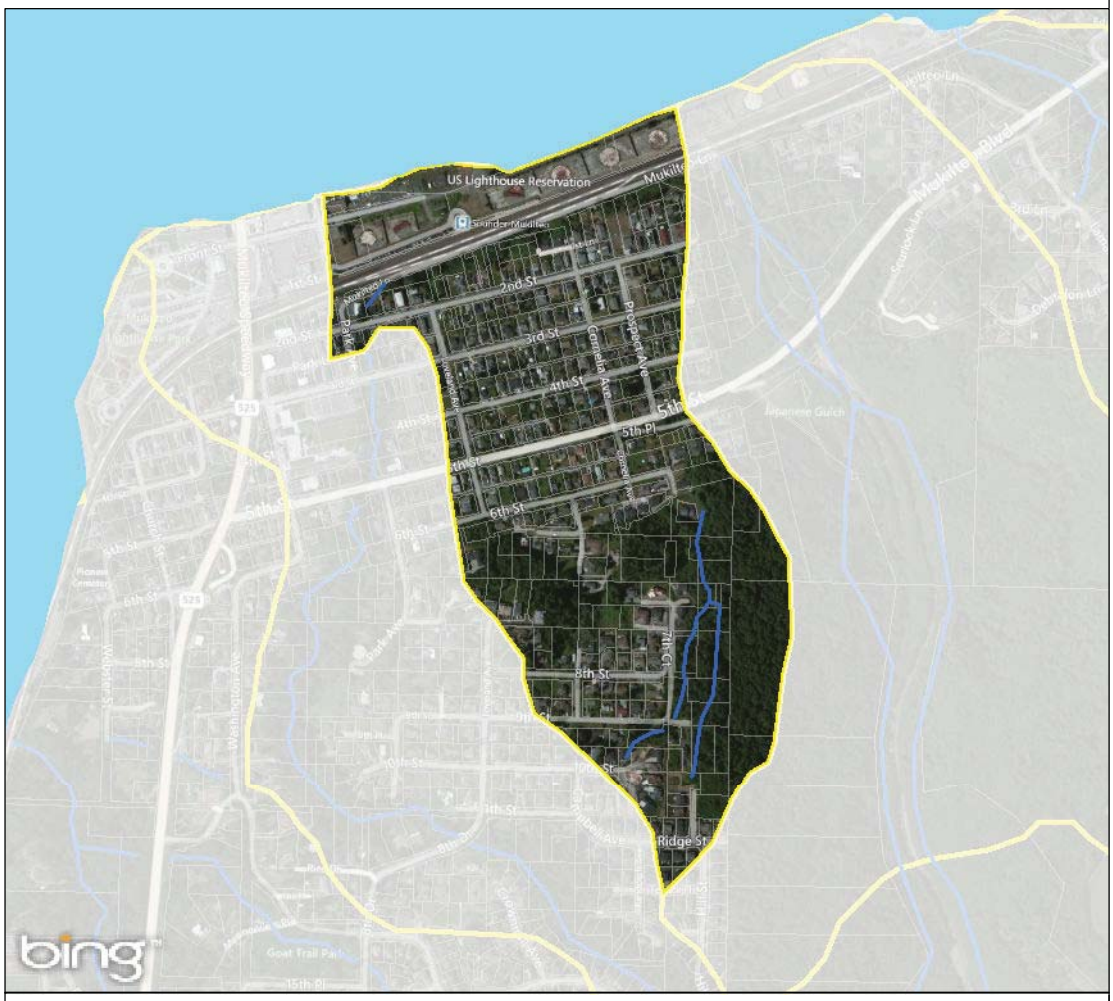
Brewery Creek East

Watershed: Brewery Creek
Management Category: Targeted Management Strategies
Priority: Moderate



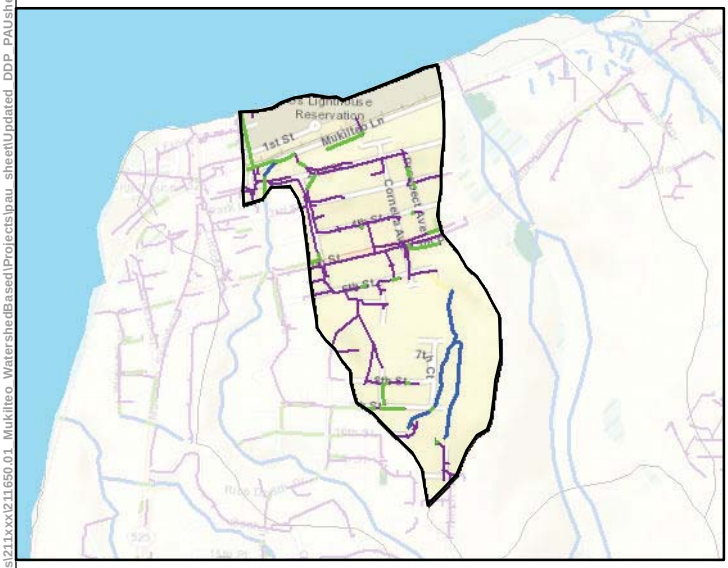
Area (acres): 133
% Impervious: 42%
% Wetland: 0.0%
Landscape Position: Ravine

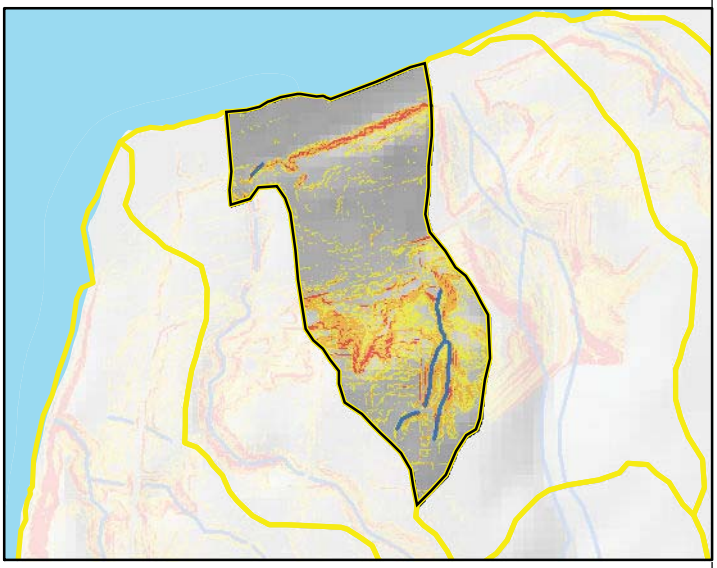




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 Feet





Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Brewery Creek East

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	low

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

There are no known constraints within this PAU. Approximately 81% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

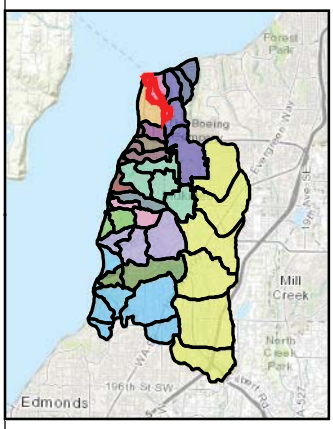
There are no known problems in this PAU.

Known Opportunities

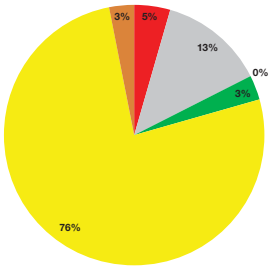
There are no known existing opportunities in this PAU.

Brewery Creek West

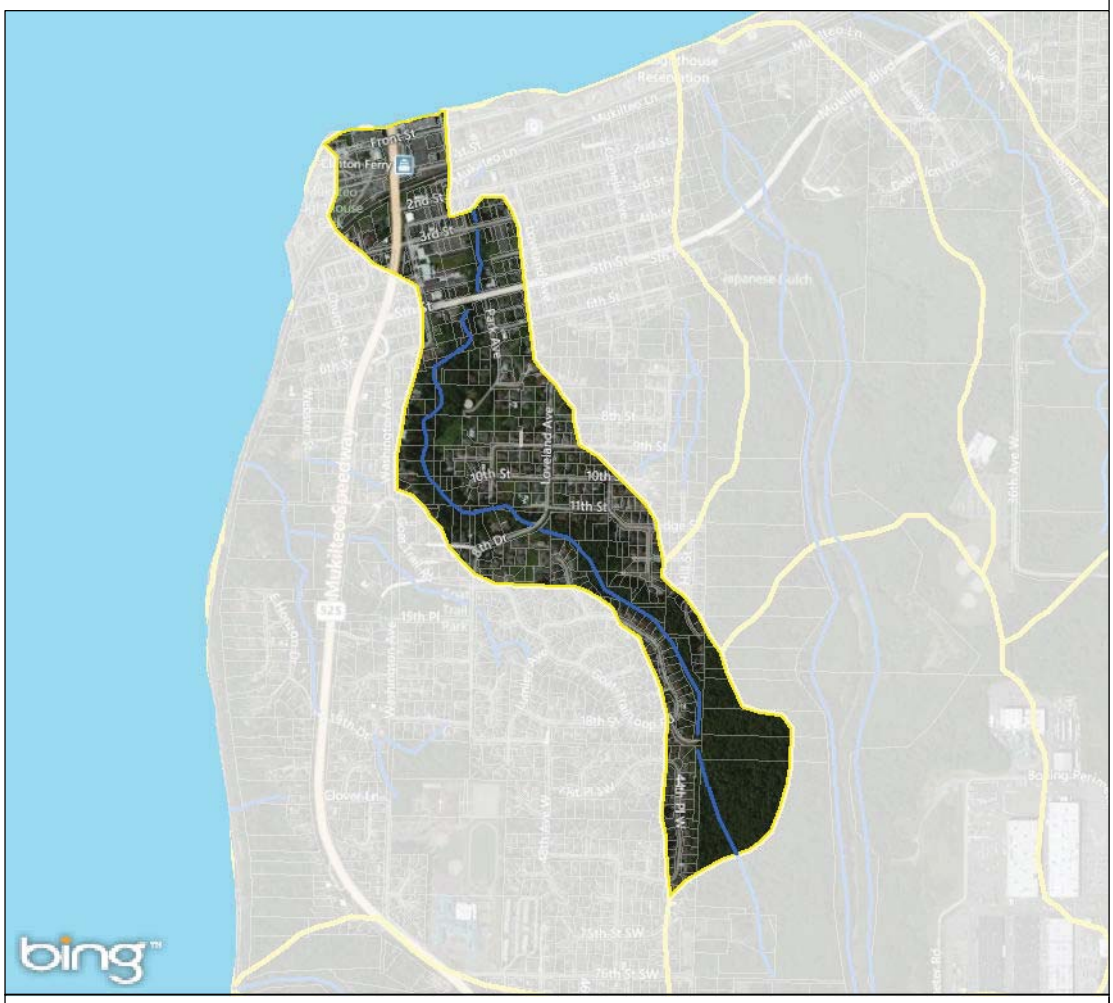
Watershed: Brewery Creek
Management Category: Targeted Management Strategies
Priority: Low



Area (acres): 171
% Impervious: 35%
% Wetland: 0.0%
Landscape Position: Ravine

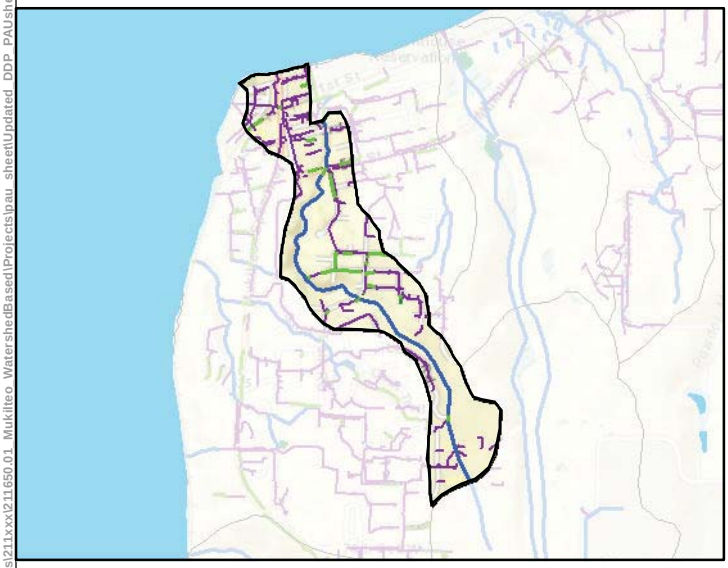


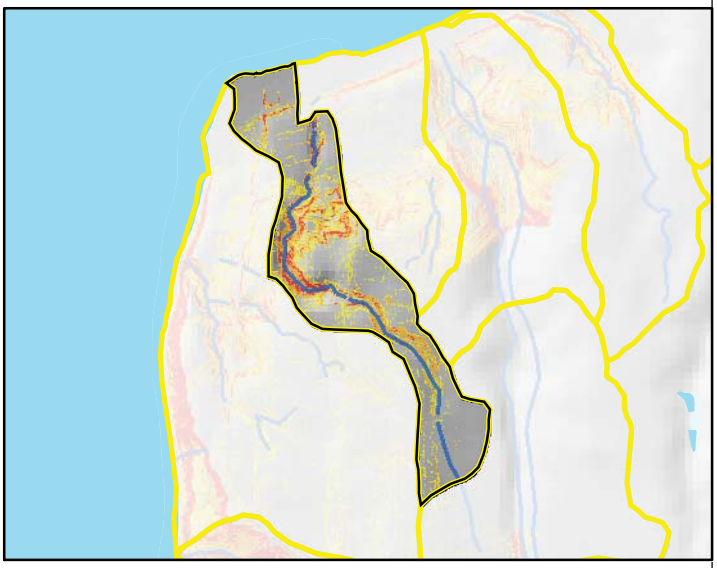
Commercial
Industrial
Multi Family
Parks Open Space
Single Family
Other



Streams
Parcels
Parks
Waterbodies

0 250500 1,000 1,500 2,000
Feet





Drainage
Streams
Pipe Network
Wetlands
Open Channel Systems
Detention Ponds (Stormwater Facilities)

Steep Slopes
Moderate
Steep
Very Steep

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Brewery Creek West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

There are no known constraints within this PAU. Approximately 76% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

There are two known problems in this PAU:

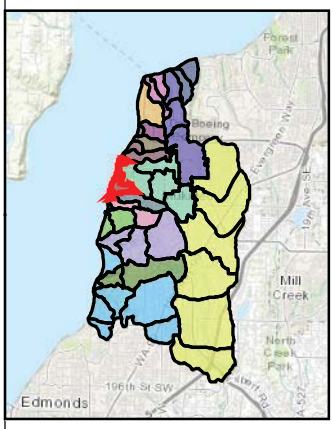
1. Frequent flooding of Lighthouse Park parking lot; mainly due to high tides.
2. Frequent flooding at the Mukilteo Lane low hydraulic gradient and deposition of sand and gravel from excessive erosion along Hidden Point.

Known Opportunities

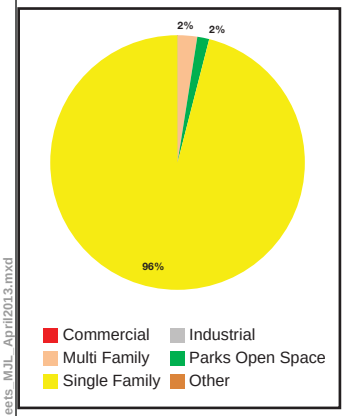
The CAMP report identified two regional mitigation sites within this PAU: M1 and MHR2.

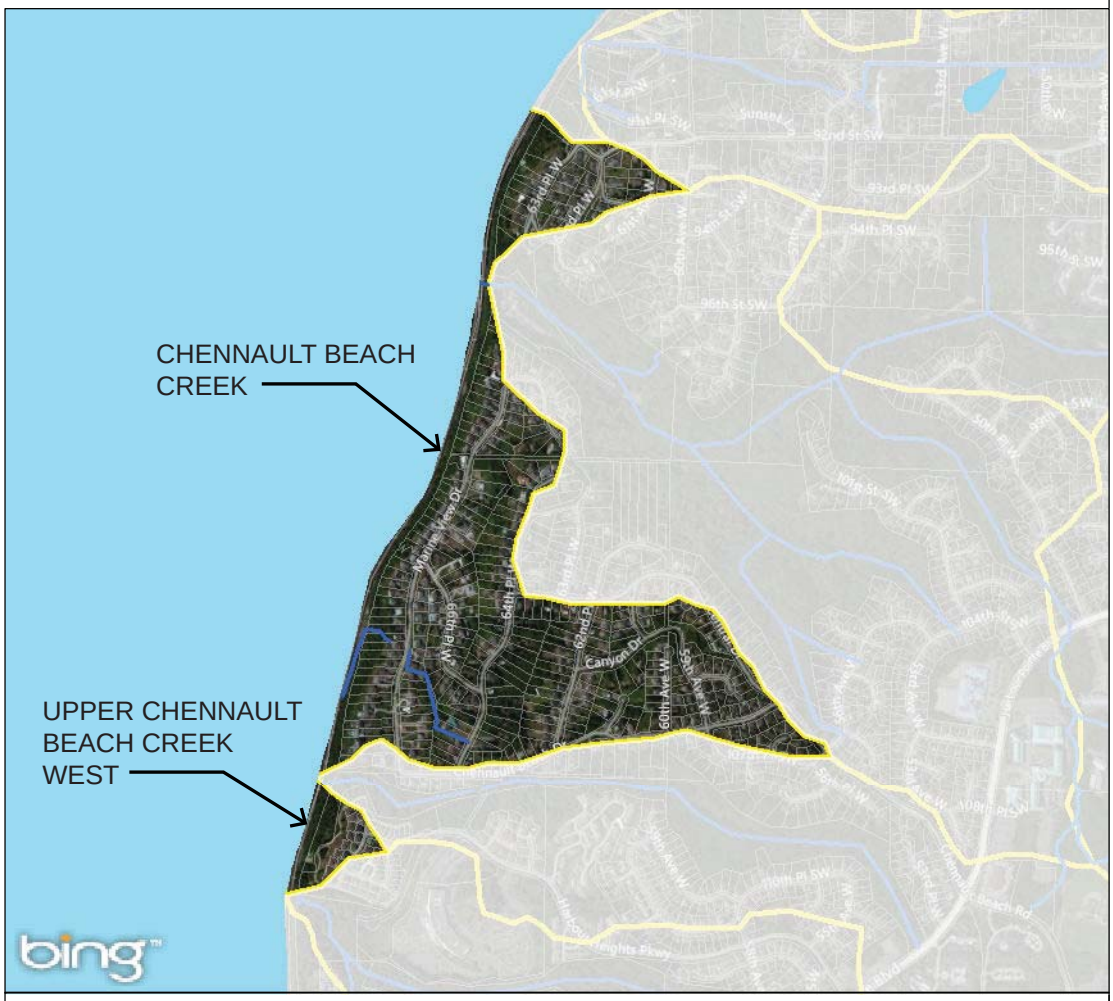
Chennault Beach Ck/Upr Chennault Beach Ck W

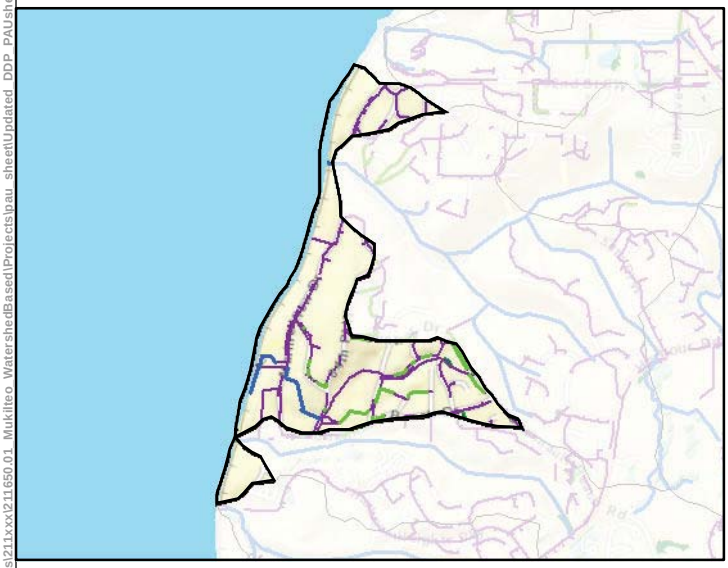
Watershed: Chennault Beach Creek
Management Category: Targeted Management Strategies
Priority: Moderate

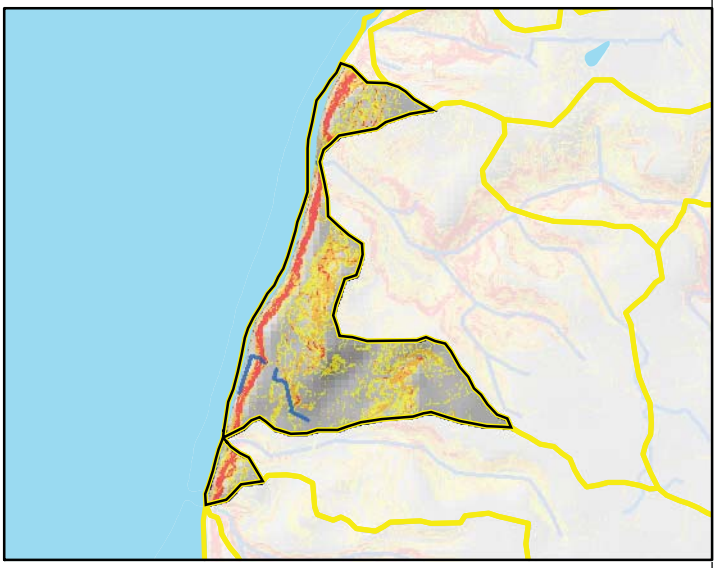


Area (acres): 184
% Impervious: 33%
% Wetland: 0.0%
Landscape Position: Bluff









Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Chennault Beach Creek / Upper Chennault Beach Creek West

Key Watershed Processes

Delivery is a key process within these PAUs. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for these PAUs*

Constraints/Existing Land Use

These PAUs contain a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 96% of these PAUs are residential development; therefore on-site strategies may be most effective.

Water Quality

These PAUs have no state impaired water quality listings.

Known Problems

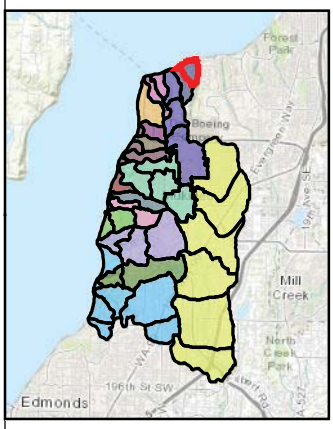
There are no known problems in these PAUs.

Known Opportunities

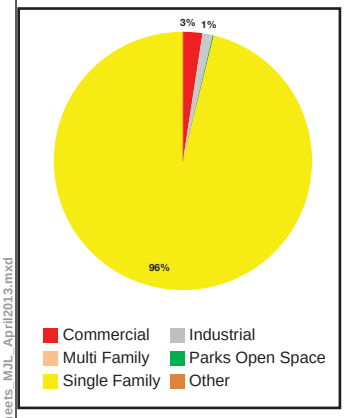
There are no known existing opportunities in these PAUs.

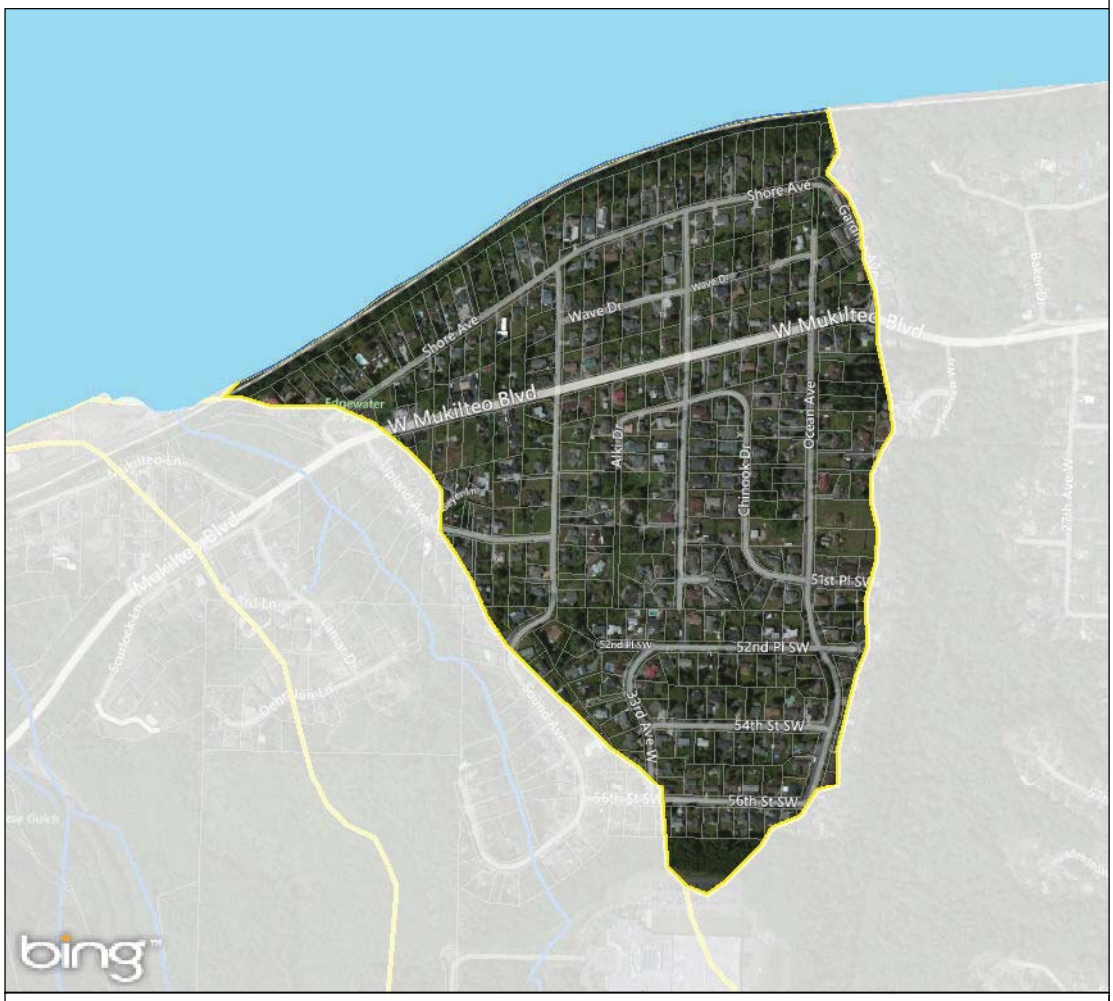
Edgewater East

Watershed: Edgewater
Management Category: Targeted Management Strategies
Priority: Low



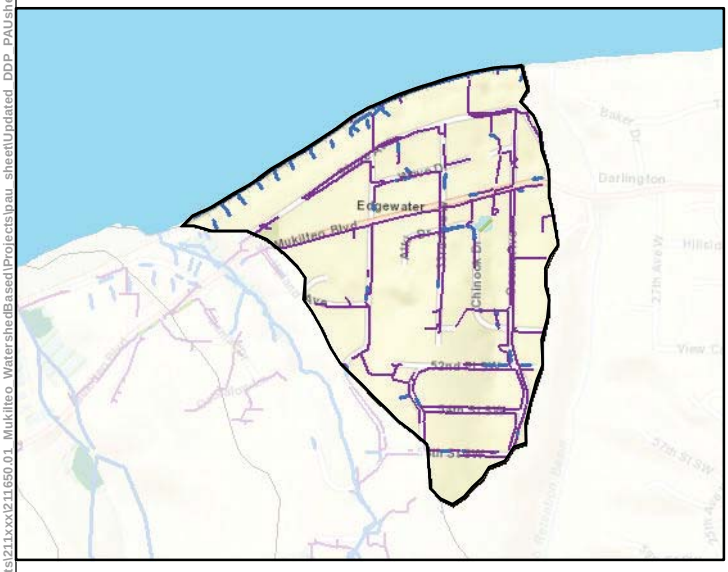
Area (acres): 165
% Impervious: 35%
% Wetland: 0.0%
Landscape Position: Bluff

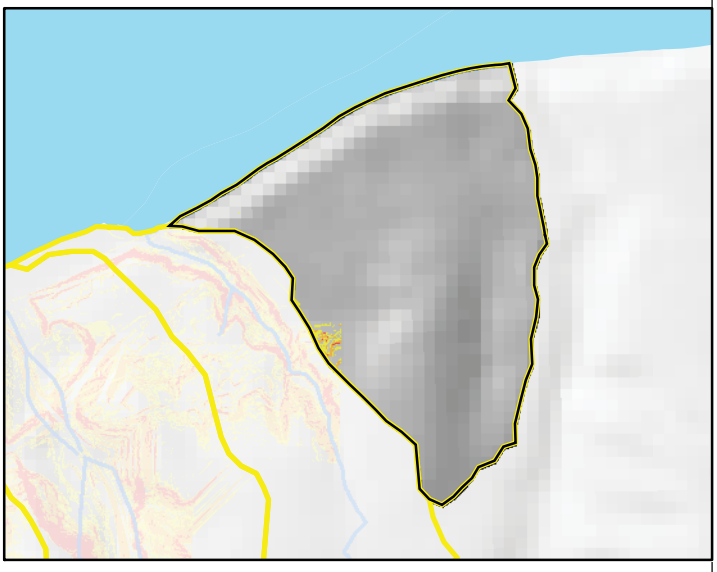




Streams
Parcels
Parks
Waterbodies

0 250 500 1,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Edgewater East

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	moderate

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 96% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

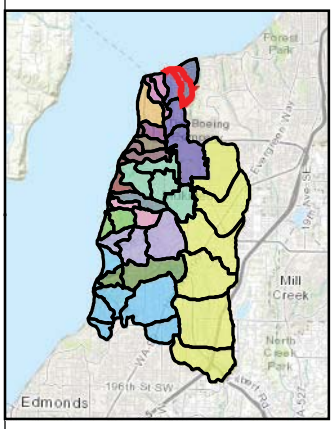
There are no known problems in this PAU.

Known Opportunities

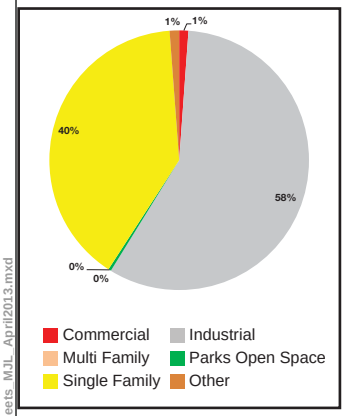
There are no known existing opportunities in this PAU.

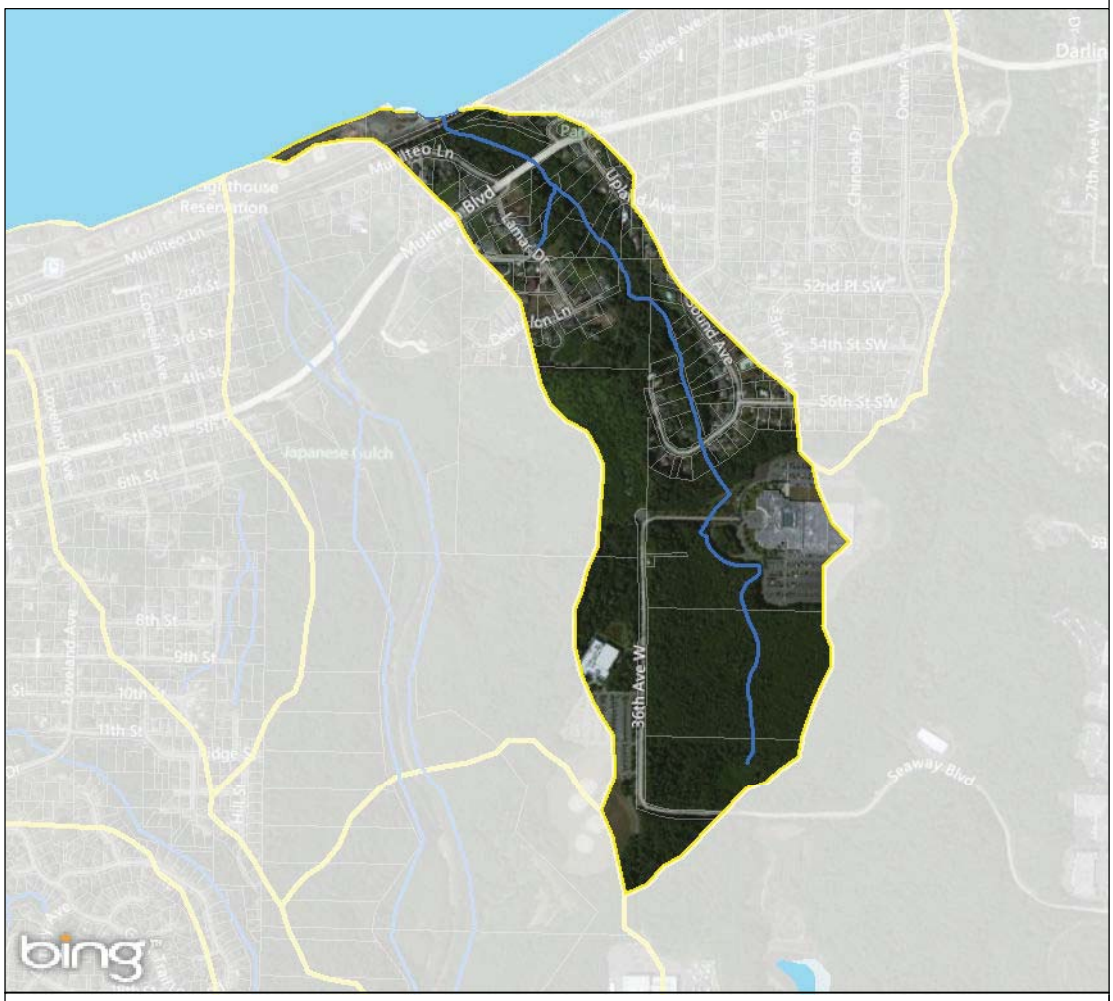
Edgewater West

Watershed: Edgewater
Management Category: Targeted Management Strategies
Priority: Low



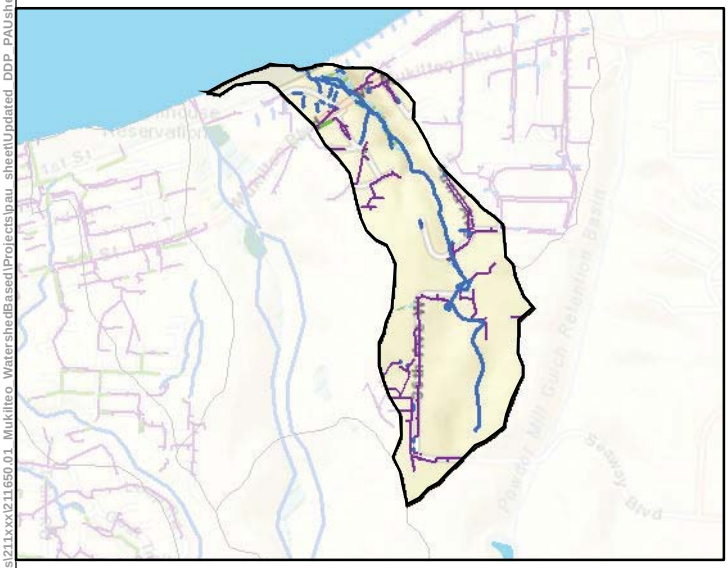
Area (acres): 175
% Impervious: 21%
% Wetland: 0.0%
Landscape Position: Ravine

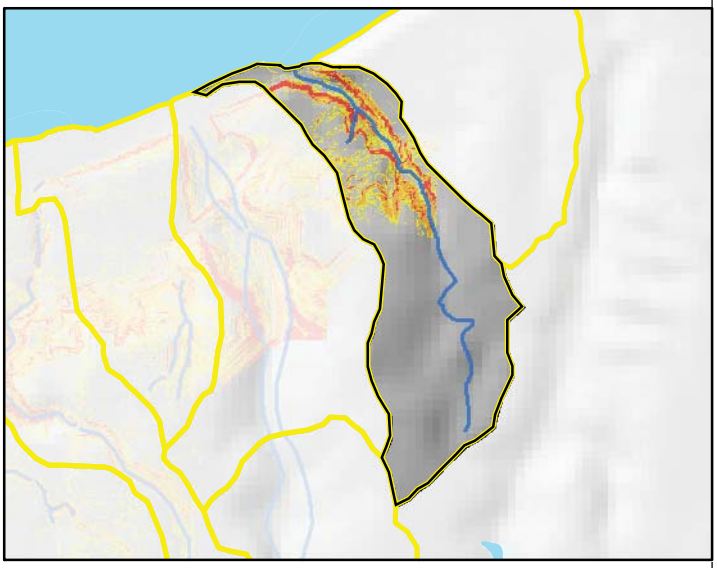




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Edgewater West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/ prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

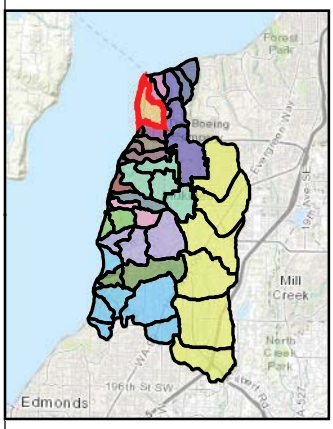
There are no known problems in this PAU.

Known Opportunities

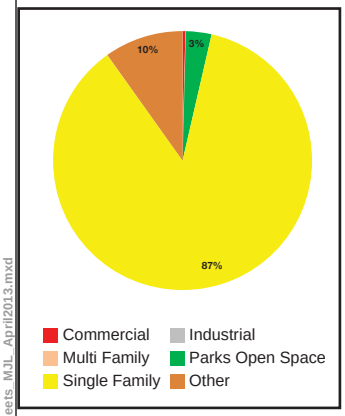
The upper portion of this PAU is forested and could be protected for upland habitat.

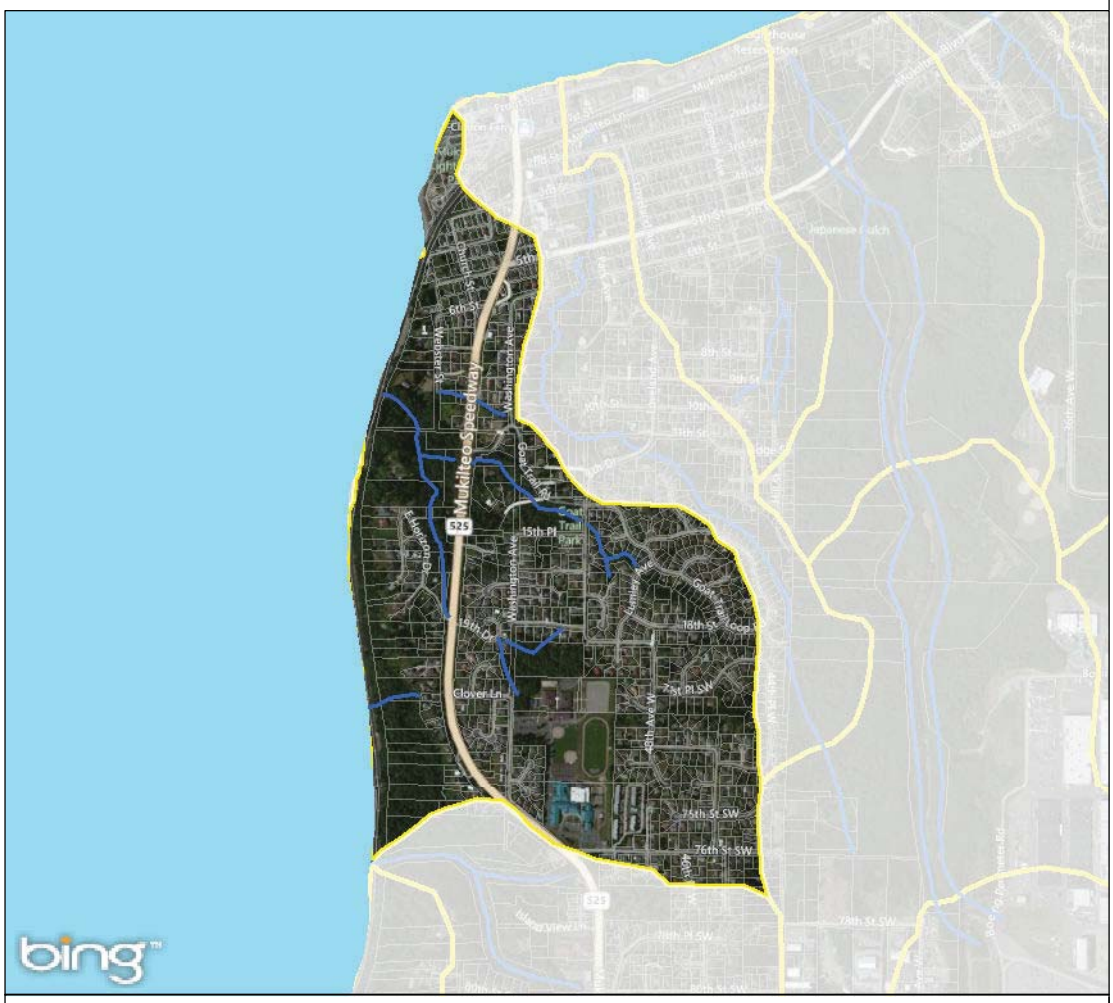
Goat Trail Ravine

Watershed: Goat Trail Ravine
Management Category: Targeted Management Strategies
Priority: Low



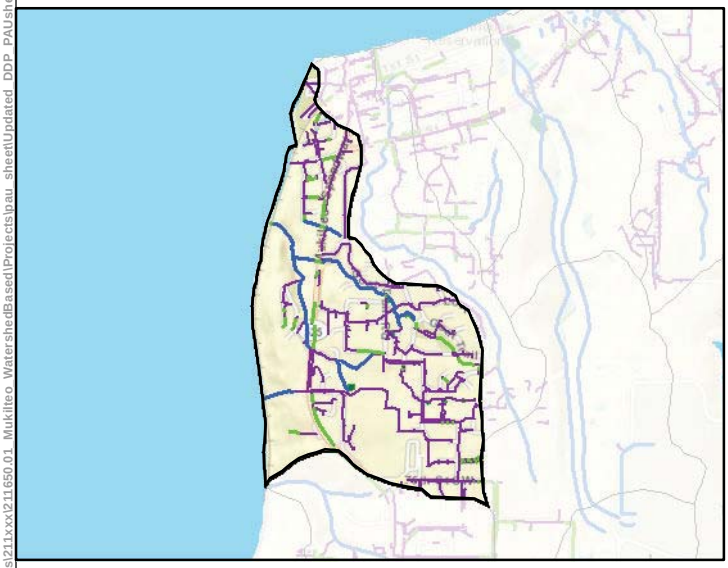
Area (acres): 382
% Impervious: 35%
% Wetland: 0.0%
Landscape Position: Ravine

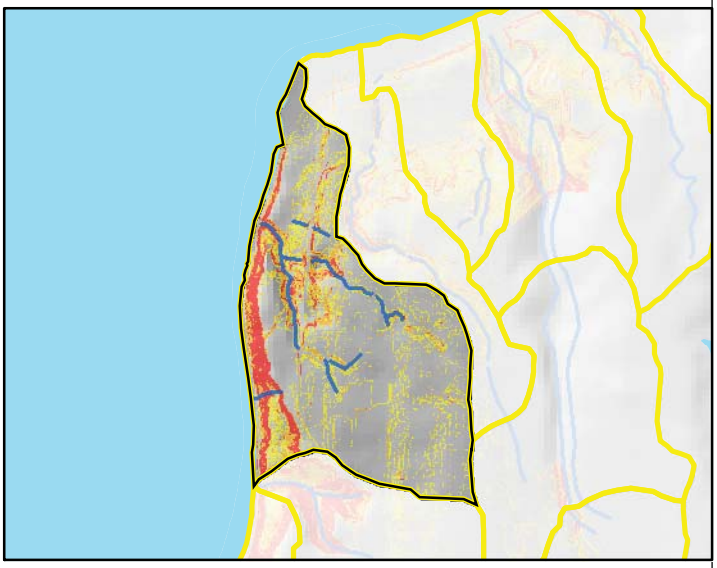




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Goat Trail Ravine

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery processes has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 87% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

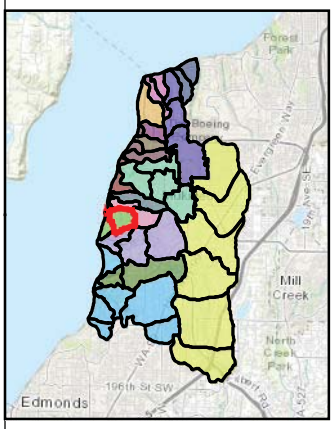
There are no known problems in this PAU.

Known Opportunities

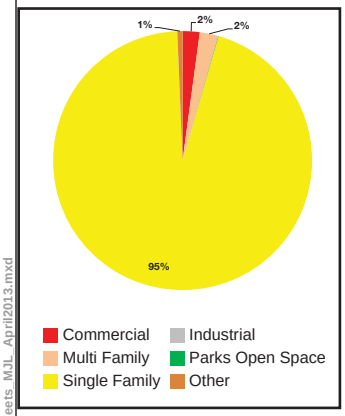
There are no known existing opportunities in this PAU.

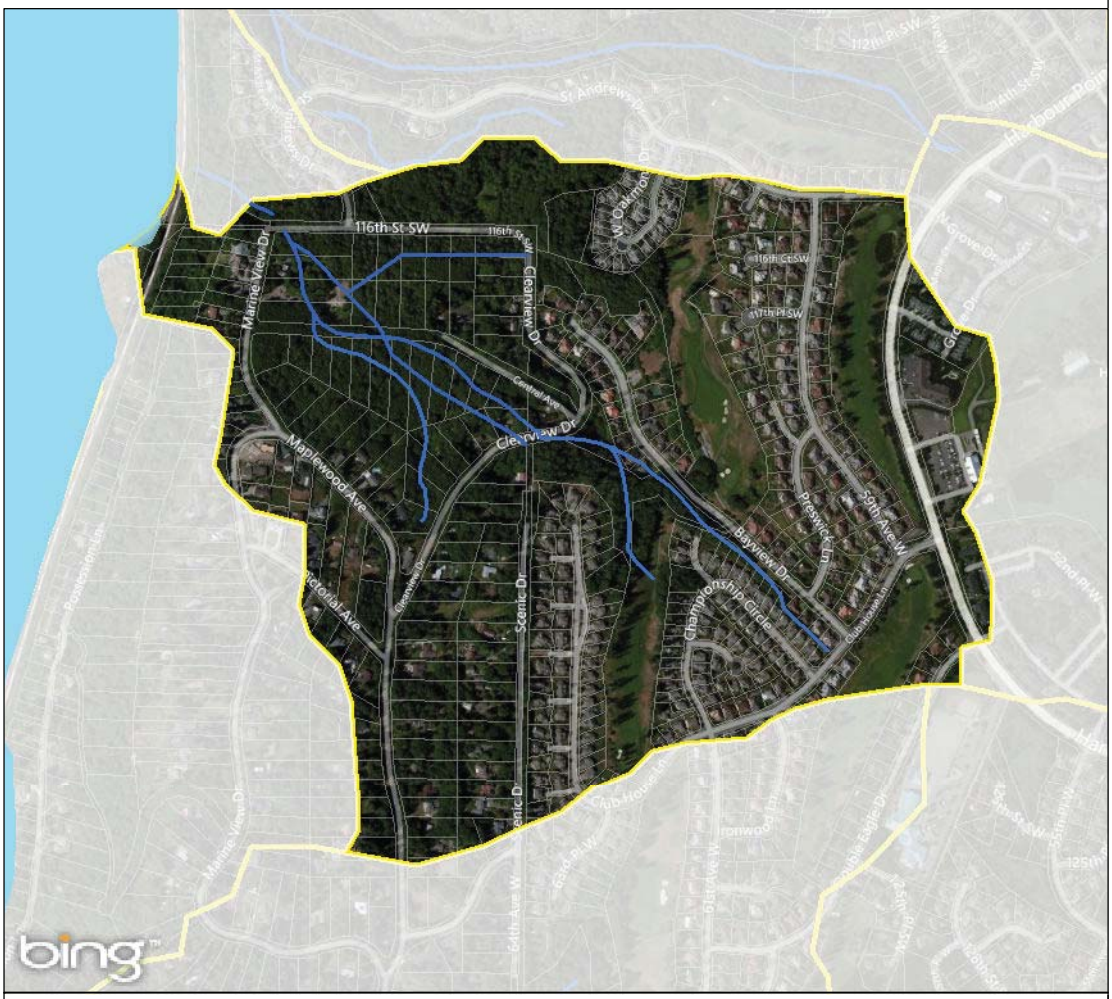
Hulk Creek East

Watershed: Hulk Creek
Management Category: Targeted Management Strategies
Priority: Low



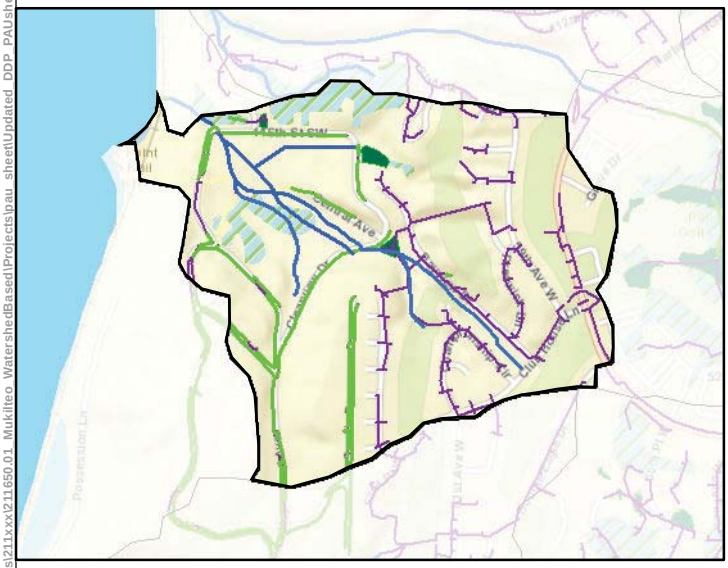
Area (acres): 248
% Impervious: 23%
% Wetland: 0.1%
Landscape Position: Ravine

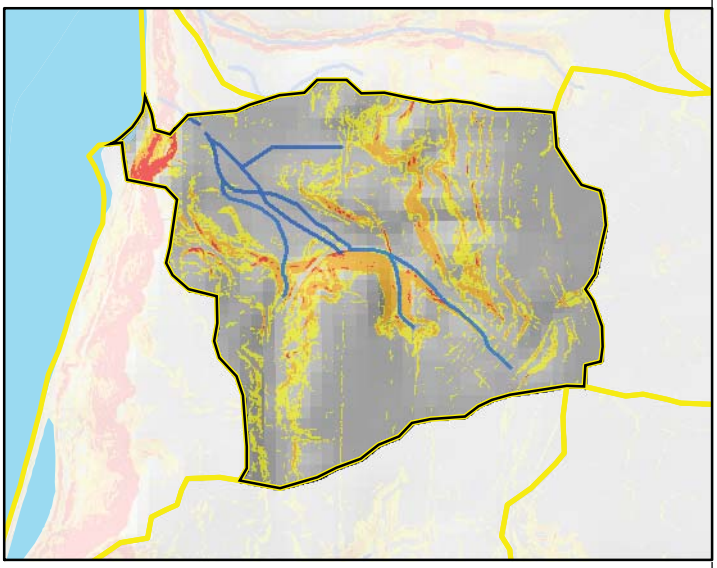




Streams Parcels Parks
Waterbodies

0 250 500 1,000
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Hulk Creek East

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	moderate

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains both a steep coastal bluff and steep ravines; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 95% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

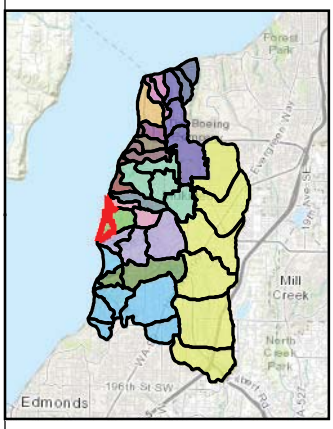
There are no known problems in this PAU.

Known Opportunities

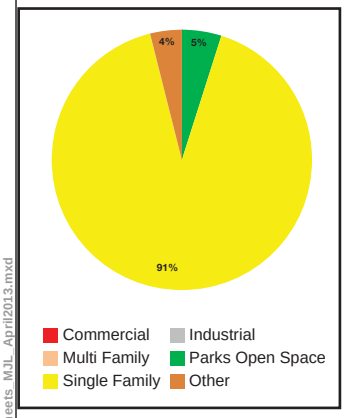
There are no known existing opportunities in this PAU.

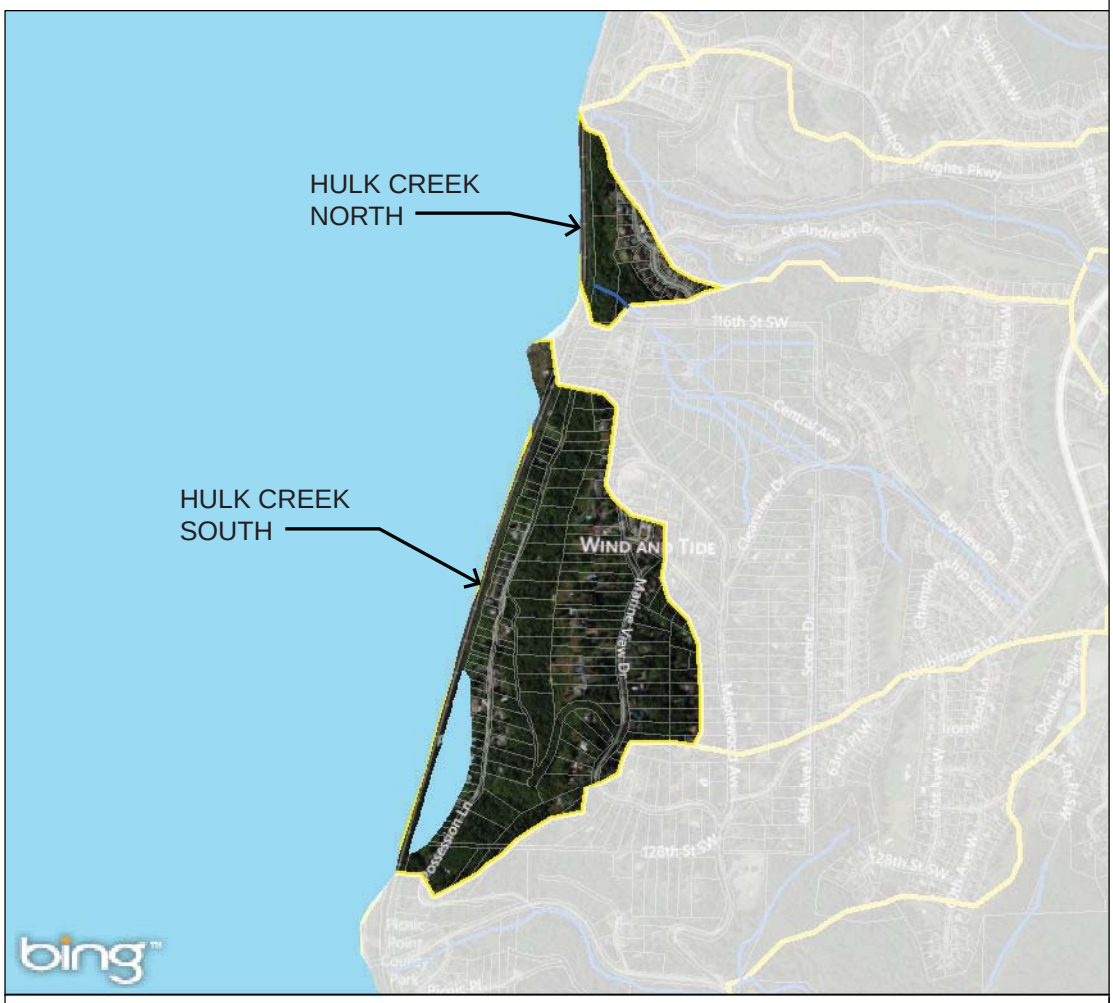
Hulk Creek North/South

Watershed: Hulk Creek
Management Category: Targeted Management Strategies
Priority: Low



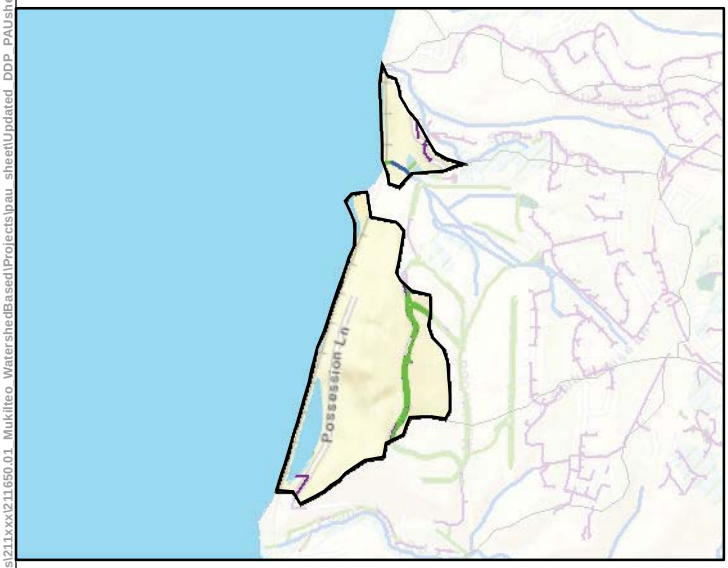
Area (acres): 127
% Impervious: 11%
% Wetland: 1.9%
Landscape Position: Bluff

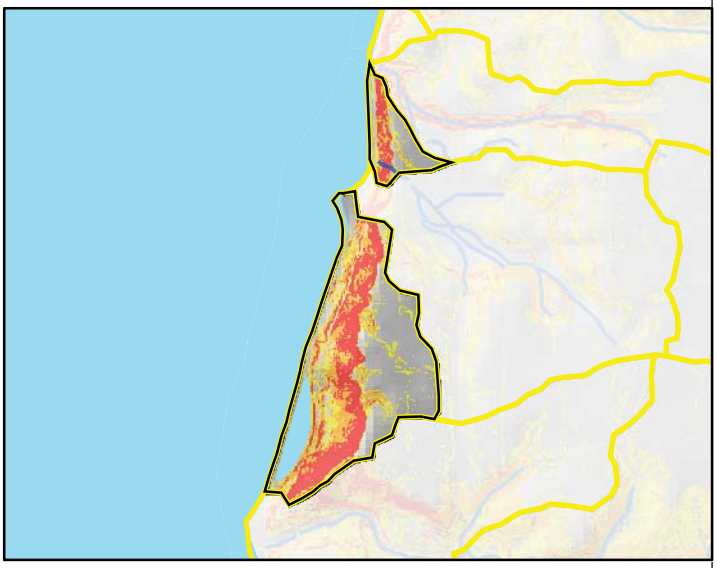




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 Feet





Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Hulk Creek North and Hulk Creek South

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 91% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

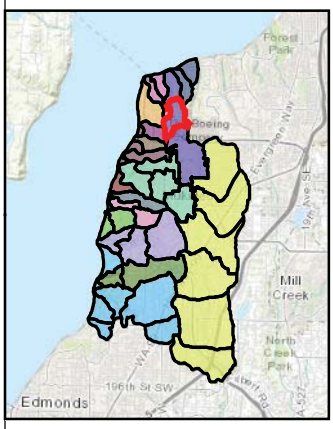
High flows are causing stream bank erosion and bank failure in Hulk Creek West.

Known Opportunities

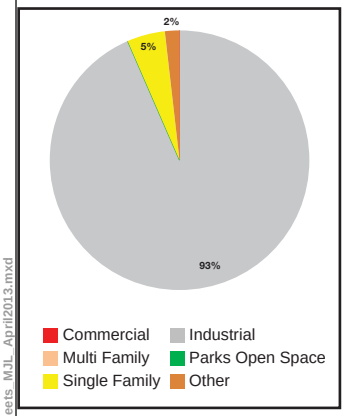
The detention pond located near Clearview Dr could be expanded to provide more storage capacity.

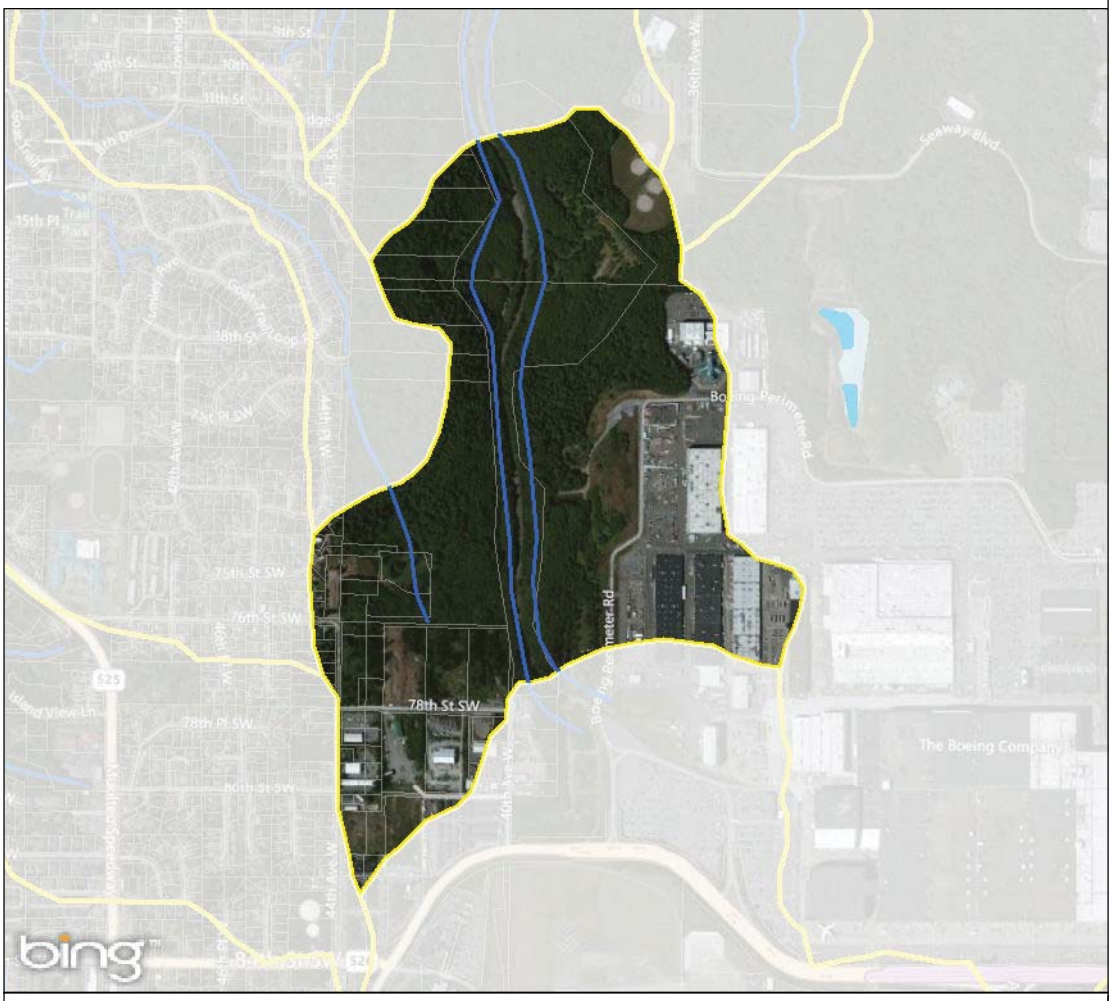
Japanese Creek Mid

Watershed: Japaneses Creek
Management Category: Targeted Management Strategies
Priority: High



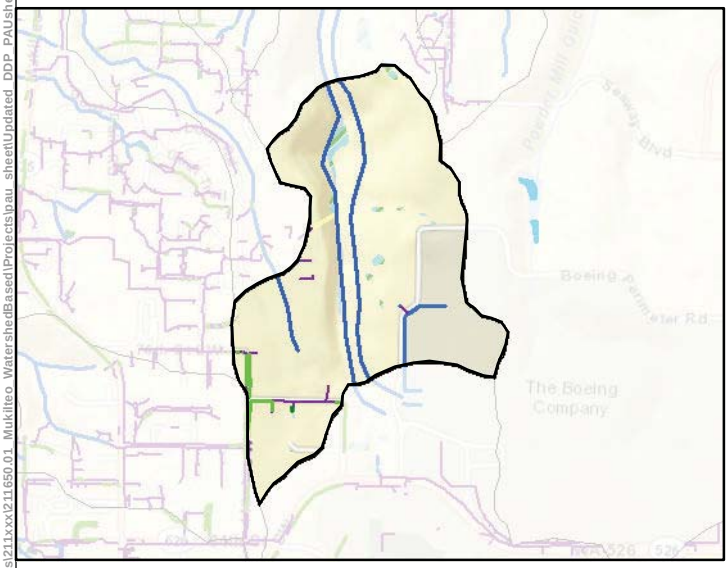
Area (acres): 277
% Impervious: 25%
% Wetland: 0.1%
Landscape Position: Ravine

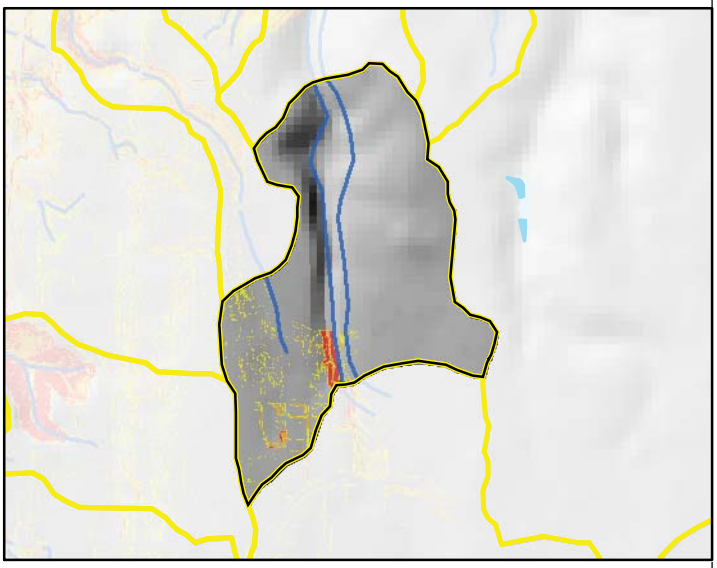




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Japanese Creek Mid

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	Plant trees	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

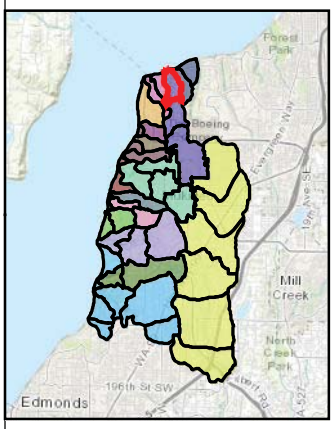
There are no known problems in this PAU.

Known Opportunities

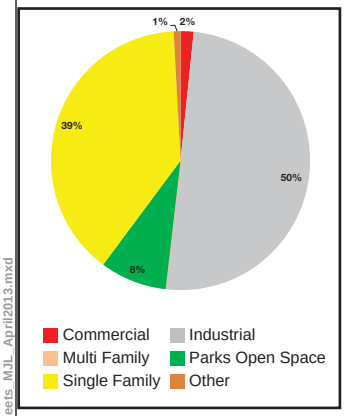
The CAMP report identified three regional mitigation sites within this PAU: M2, MHR1, and MHR2.

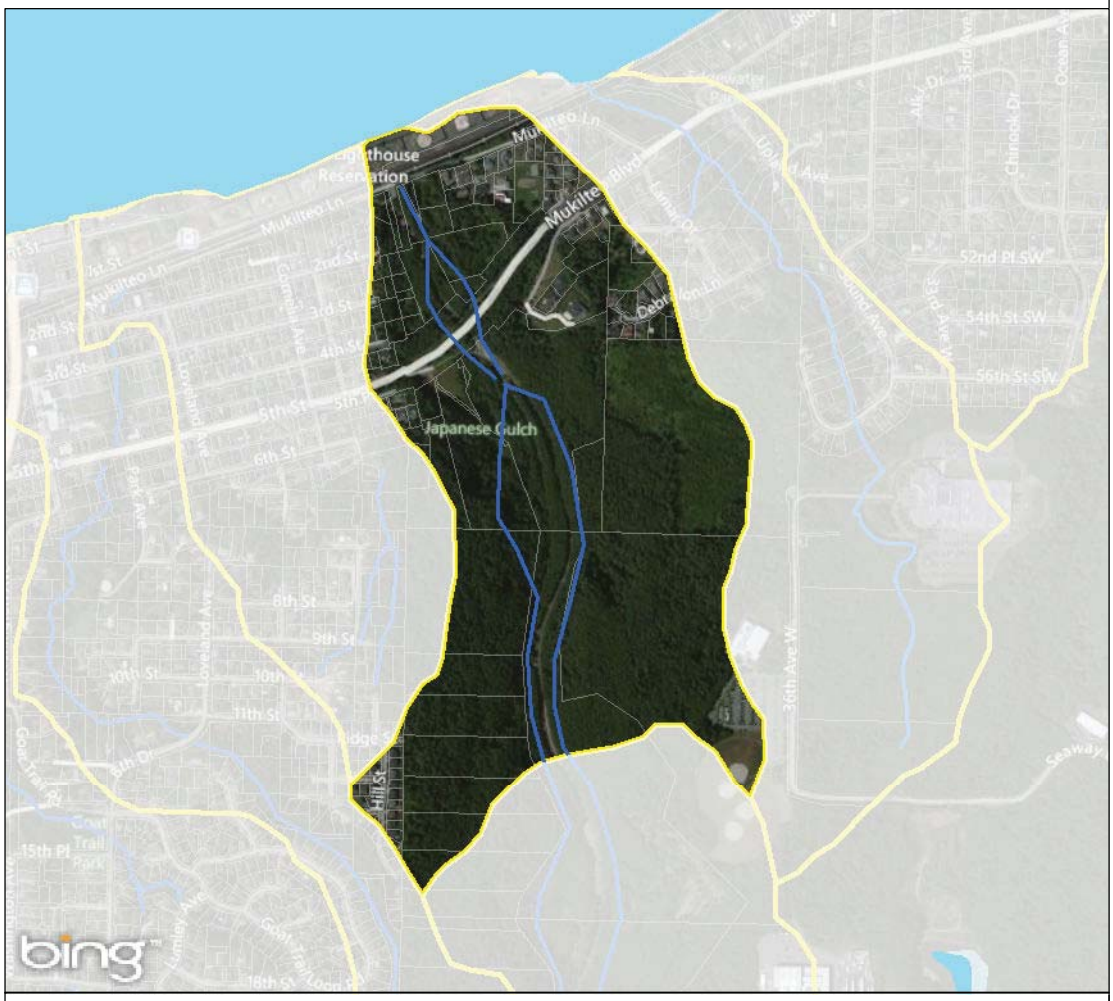
Japanese Creek North

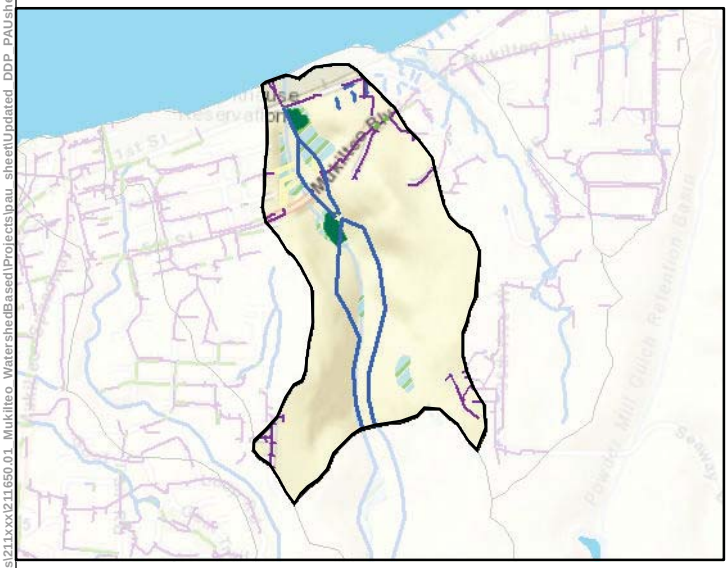
Watershed: Japaneses Creek
Management Category: Preserve
Priority: Highest

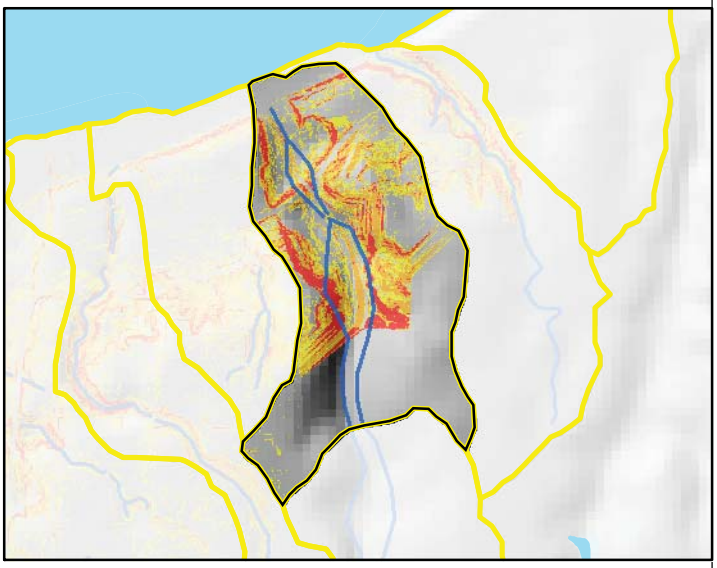


Area (acres): 213
% Impervious: 13%
% Wetland: 0.4%
Landscape Position: Plateau









Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Japanese Creek North

Key Watershed Processes

Delivery and discharge are key processes within this PAU. Based on this analysis, the discharge process is relatively intact, but delivery process is impaired by impervious surfaces and surface storage has been impaired by loss of wetlands.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	moderate	low
Recharge[1]	n/a	n/a
Discharge	high	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process and Surface Storage

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	**Protect/acquire open space**
Restore depressional wetlands	**Plant trees**	**Restore upland revegetation**
Permeable pavement	**Rain gardens**	**Restore buffer vegetation**
Bioretention swale	**Vegetated filter strips**	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains portions of a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

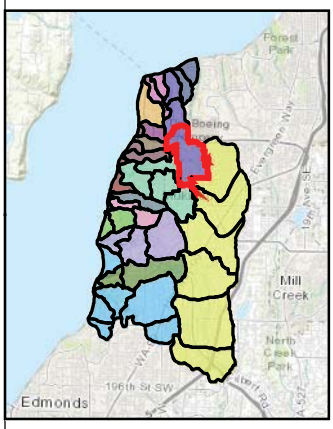
There were flooding problems in 2005/2006 in the BNSF right-of-way, likely due to the BNSF culvert located under the Boeing Access Rd.

Known Opportunities

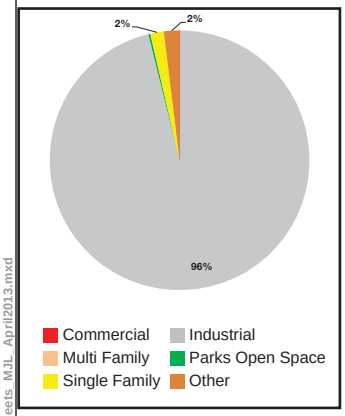
The CAMP report identified one regional mitigation site within this PAU: M1.

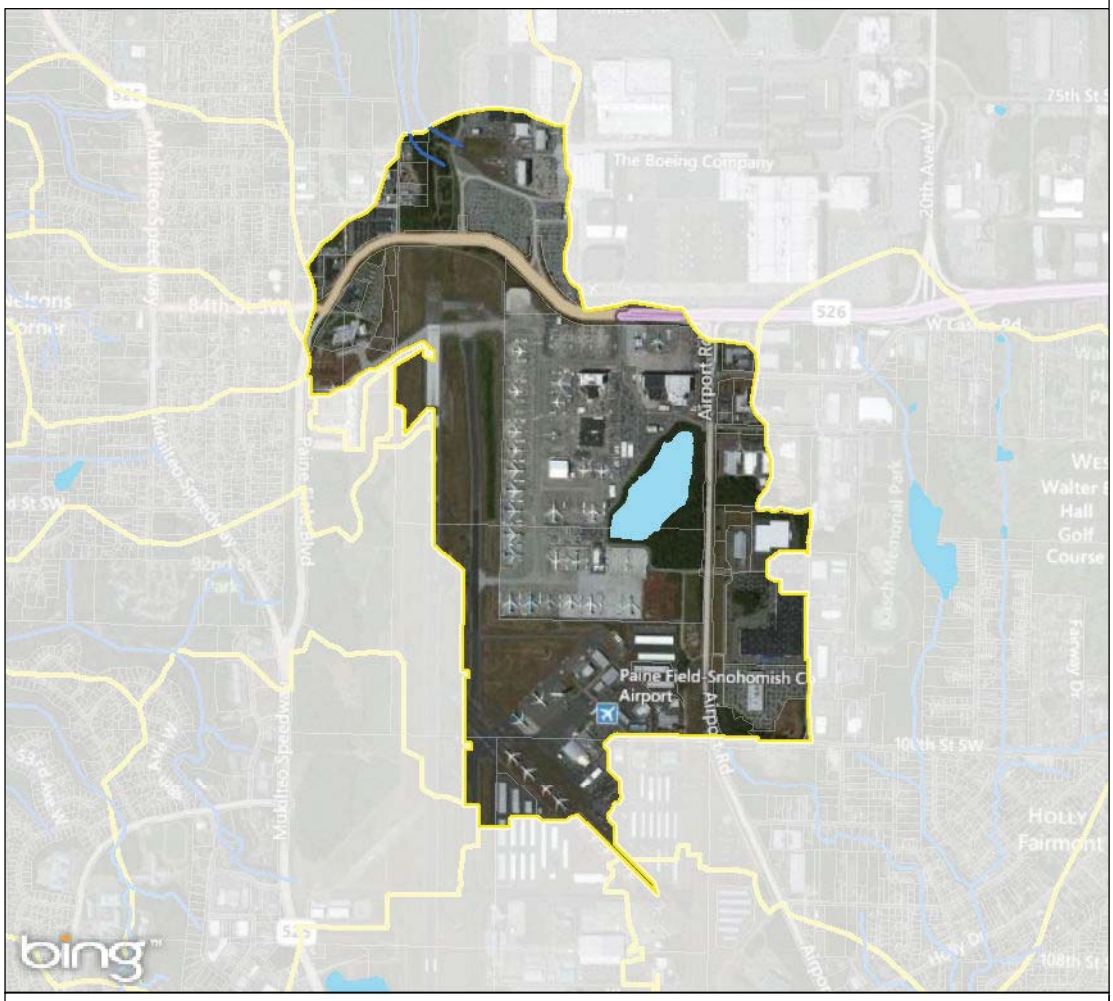
Japanese Creek South

Watershed: Japaneses Creek
Management Category: Targeted Management Strategies
Priority: High



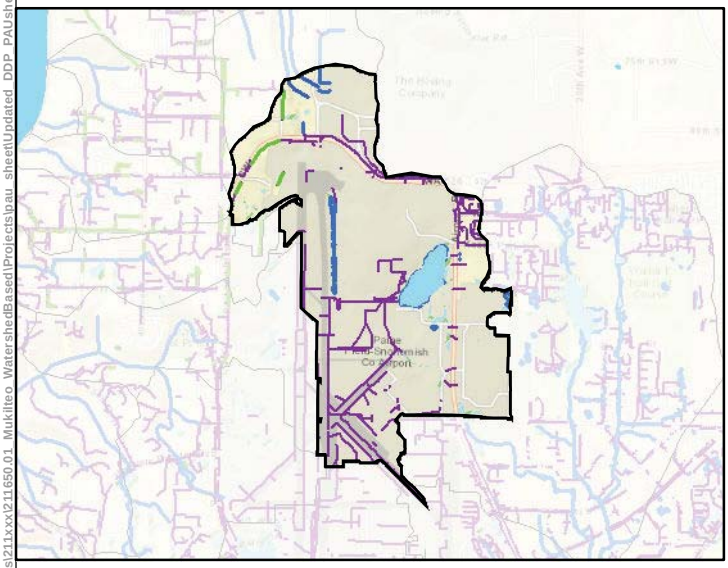
Area (acres): 659
% Impervious: 63%
% Wetland: 2.7%
Landscape Position: Plateau

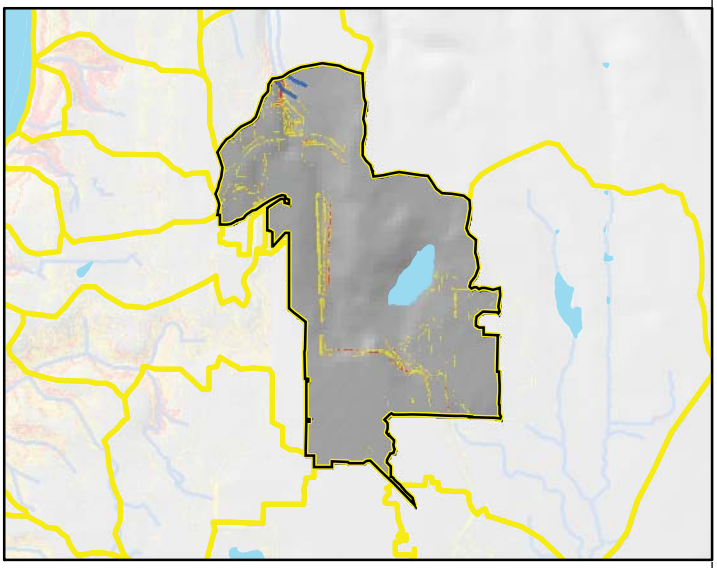




Streams Parcels Parks
Waterbodies

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Japanese Creek South

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge	high	low
Discharge	low	low

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains 96% industrial land cover which may limit the use of strategies that infiltrate stormwater due to risks associated with spills.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

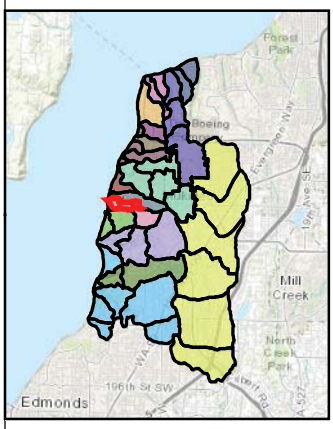
There are no known problems in this PAU.

Known Opportunities

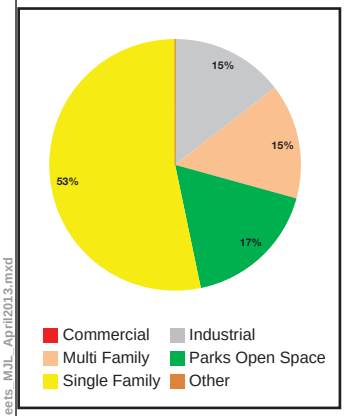
There are no known existing opportunities in this PAU.

Lower Chennault

Watershed: Lower Chennault Beach Creek North
Management Category: Targeted Management Strategies
Priority: Moderate

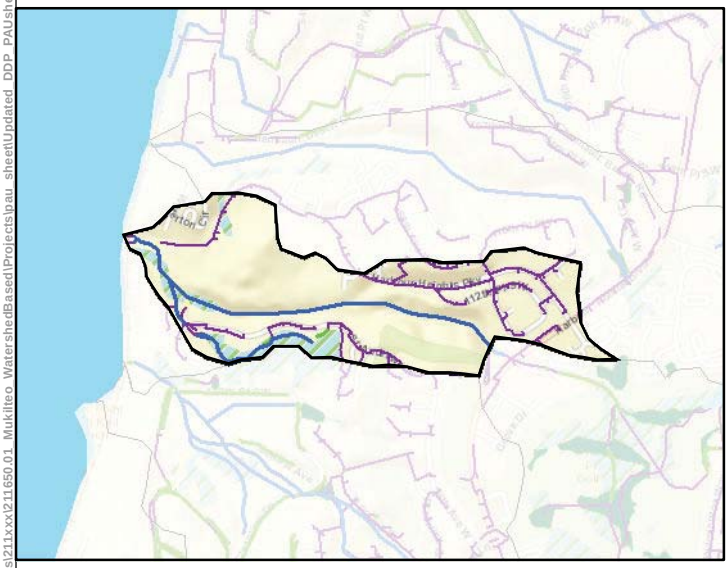


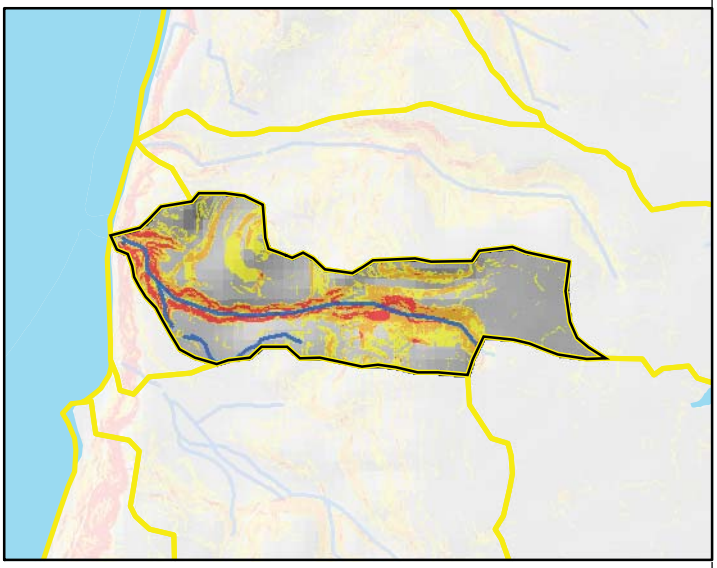
Area (acres): 122
% Impervious: 31%
% Wetland: 0.1%
Landscape Position: Ravine



Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lower Chennault
Beach Creek North

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

Much of the land in this PAU is located in a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/ prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

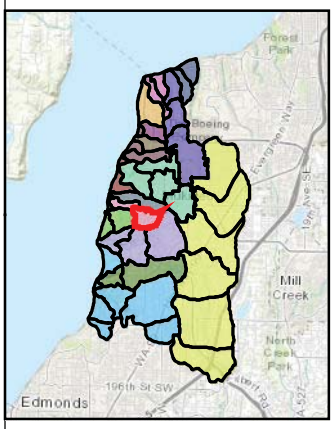
High flows have been causing stream bank collapse and small landslides.

Known Opportunities

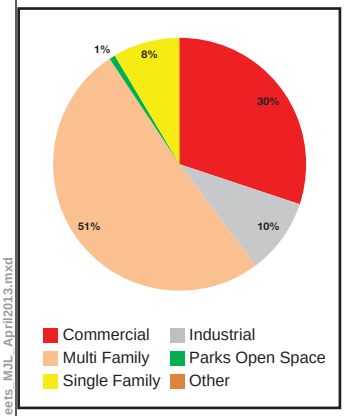
There are no known existing opportunities in this PAU.; however, 17% of this PAU is in parks and open space, which may provide opportunities.

Lower Chennault

Watershed: Lower Chennault Beach Creek South
Management Category: Preserve
Priority: Highest

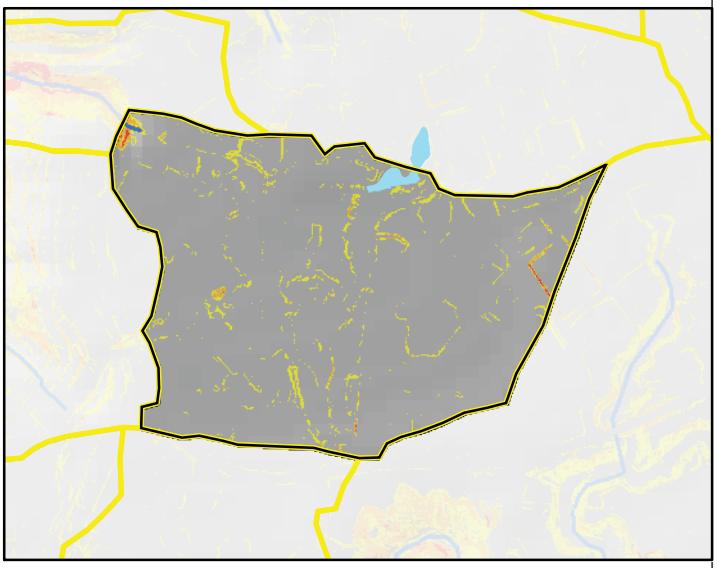


Area (acres): 215
% Impervious: 30%
% Wetland: 21.2%
Landscape Position: Plateau



Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 Feet



Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lower Chennault
Beach Creek South

Key Watershed Processes

Delivery, surface storage, and recharge are key processes within this PAU. Based on this analysis, storage processes are relatively intact, but delivery and recharge processes are impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	high	high
Recharge	high	moderate
Discharge	low	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	**Protect/acquire open space**
Bioretention swale	**Plant trees**	**Restore upland revegetation**
Bioretention cells and planters	**Rain gardens**	**Restore buffer vegetation**
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

Much of the land in this PAU is developed by a golf course. Although the PAU scored high for the watershed processes measured; water quality may be impaired.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

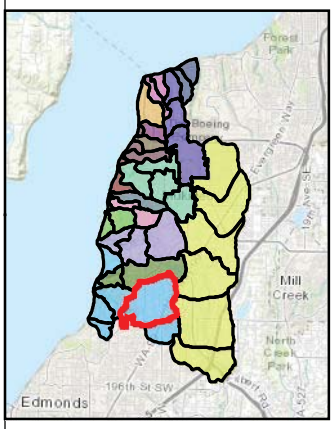
There are no known problems in this PAU.

Known Opportunities

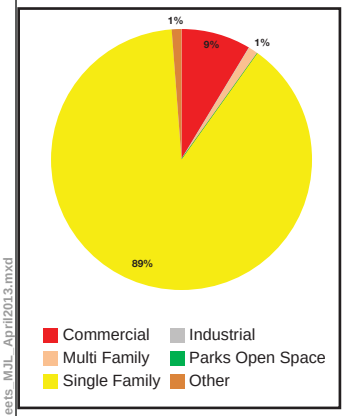
There are no known existing opportunities in this PAU.

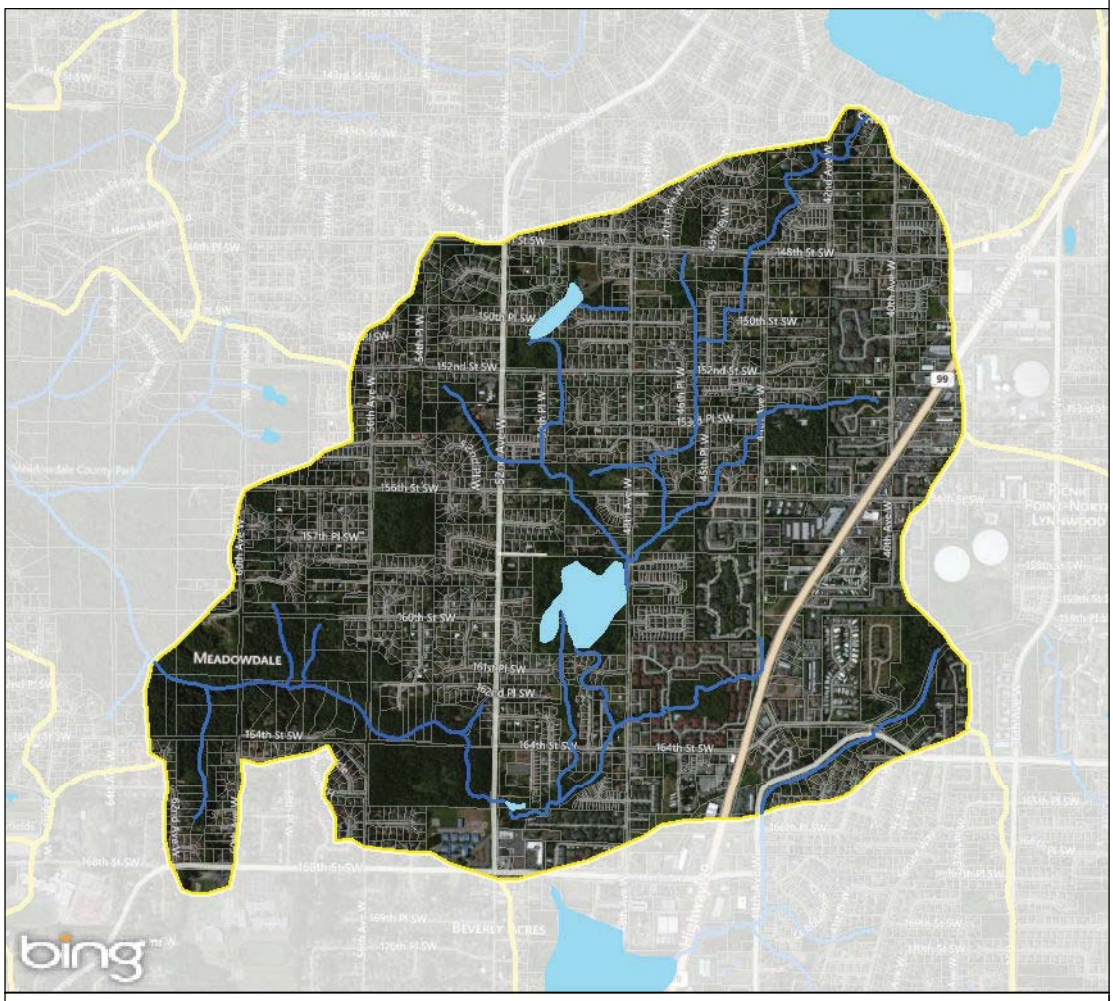
Lunds Gulch East

Watershed: Lunds Gulch
Management Category: Targeted Management Strategies
Priority: High



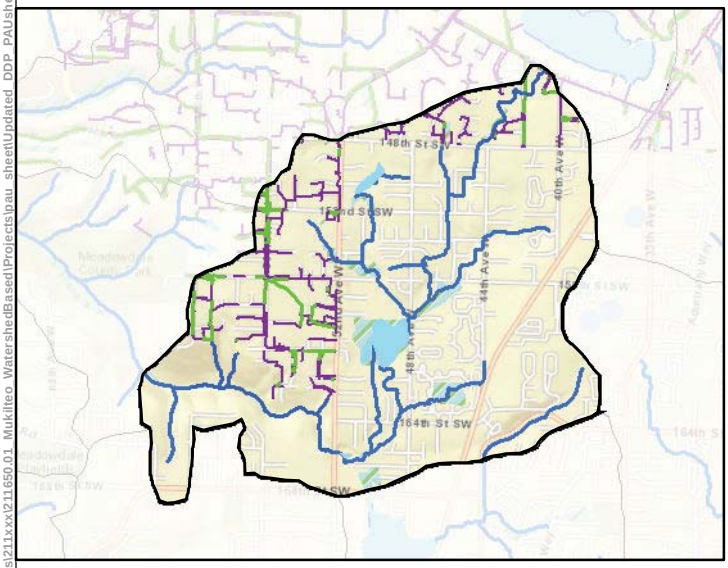
Area (acres): 1044
% Impervious: 38%
% Wetland: 2.0%
Landscape Position: Plateau

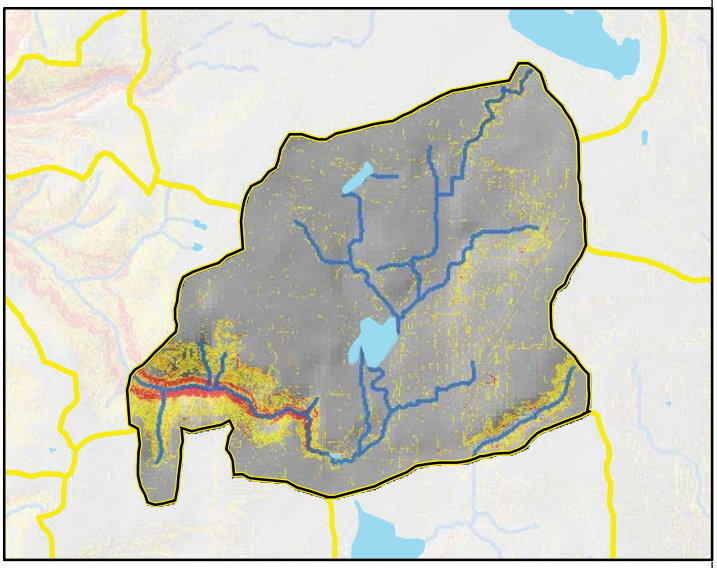




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lunds Gulch East

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	high

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has a steep ravine located in the southwest corner; Use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 89% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

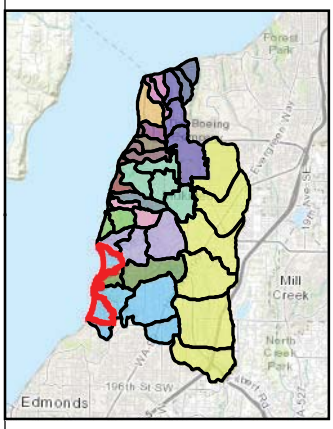
There are no known problems in this PAU.

Known Opportunities

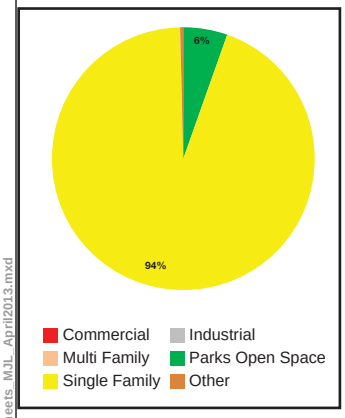
There are no known existing opportunities in this PAU.

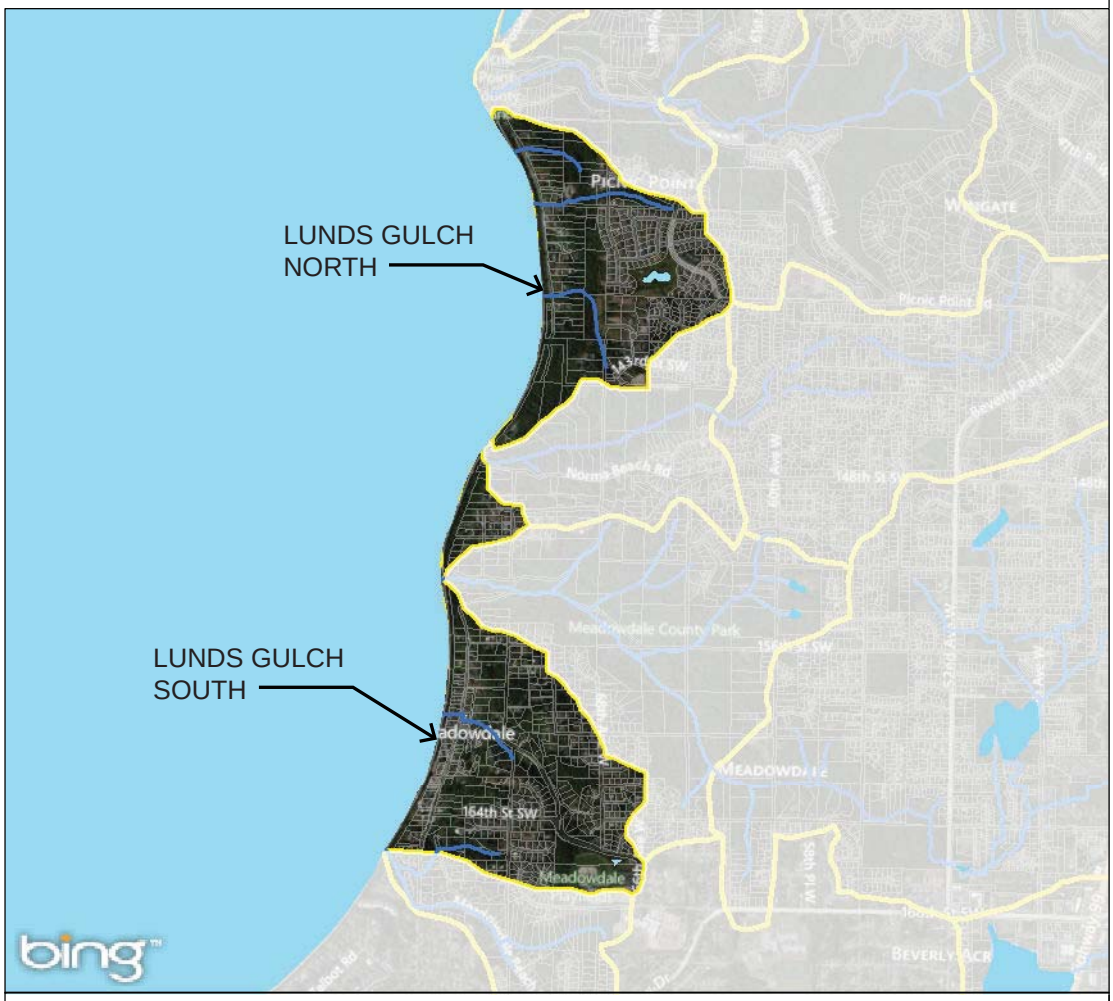
Lunds Gulch North/Central/ South

Watershed: Lunds Gulch
Management Category: Targeted Management Strategies
Priority: Low



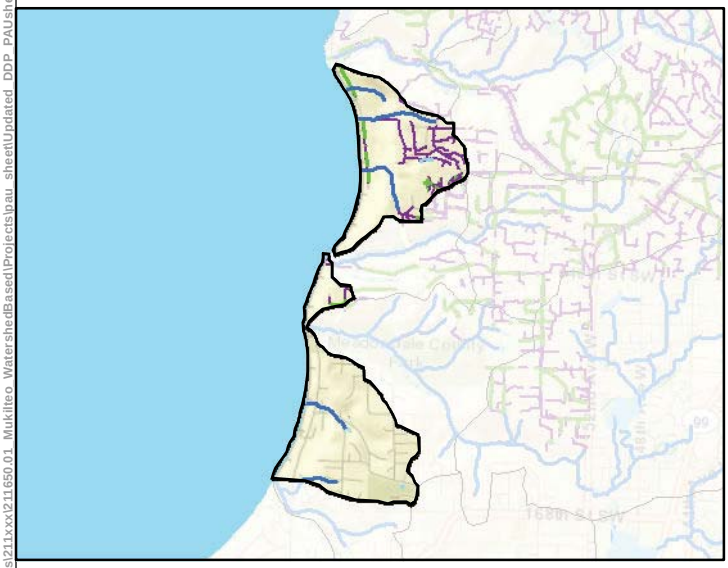
Area (acres): 470
% Impervious: 20%
% Wetland: 0.0%
Landscape Position: Bluff

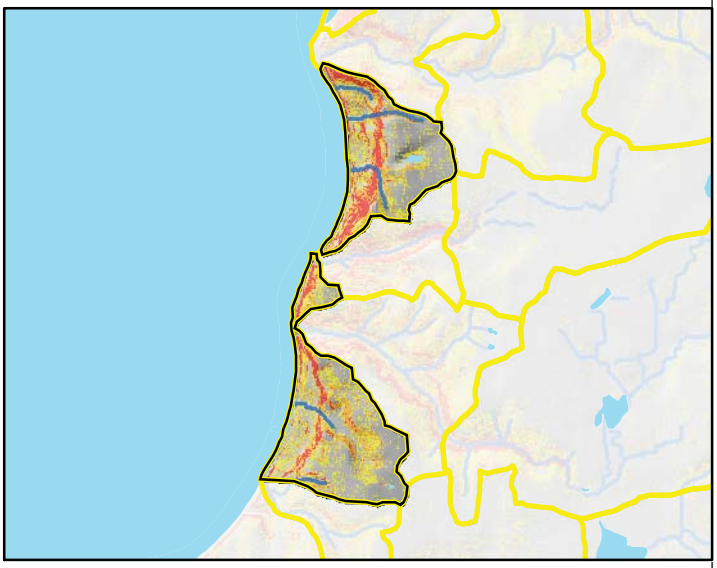




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 Feet





Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lunds Gulch North/Central/South

Key Watershed Processes

Delivery is a key process within these PAUs. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for these PAUs*

Constraints/Existing Land Use

These PAUs contain a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 94% of these PAUs are residential development; therefore on-site strategies may be most effective.

Water Quality

These PAUs have no state impaired water quality listings.

Known Problems

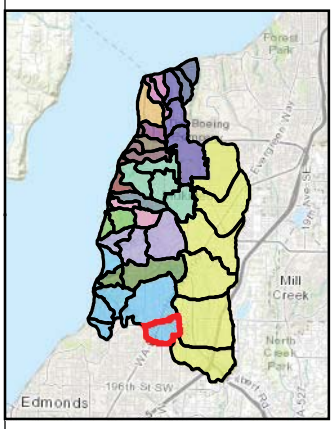
There are no known problems in these PAUs.

Known Opportunities

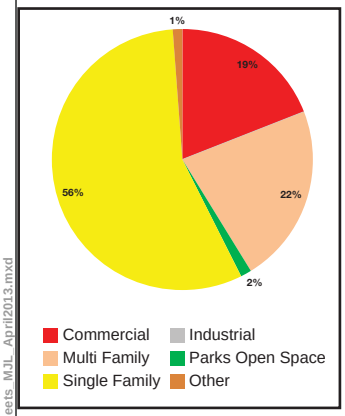
There are no known existing opportunities in these PAUs.

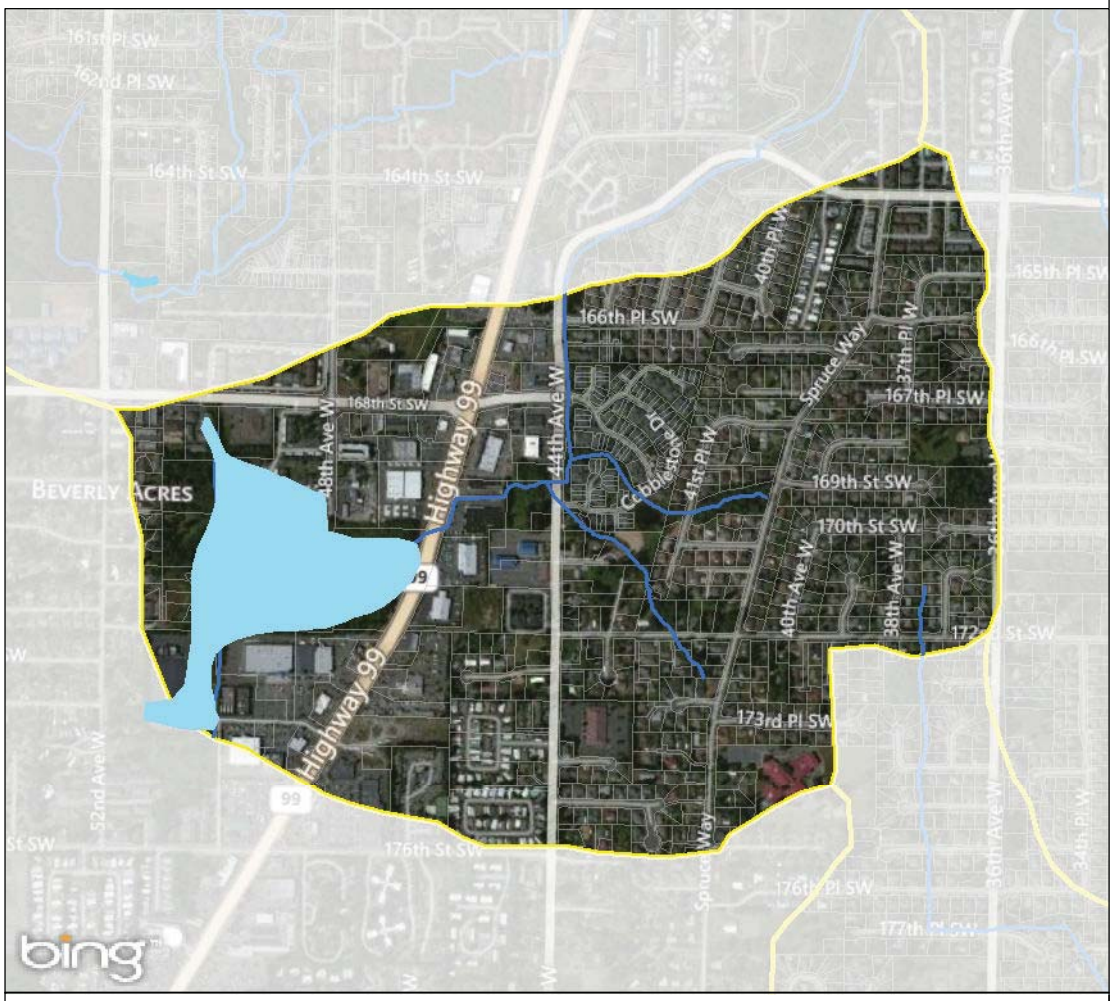
Lunds Gulch SE

Watershed: Lunds Gulch
Management Category: Targeted Management Strategies
Priority: High



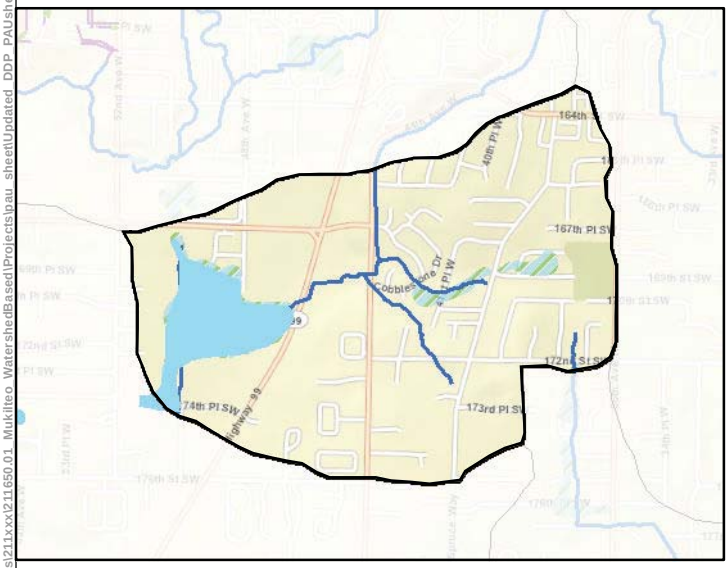
Area (acres): 344
% Impervious: 54%
% Wetland: 7.5%
Landscape Position: Plateau

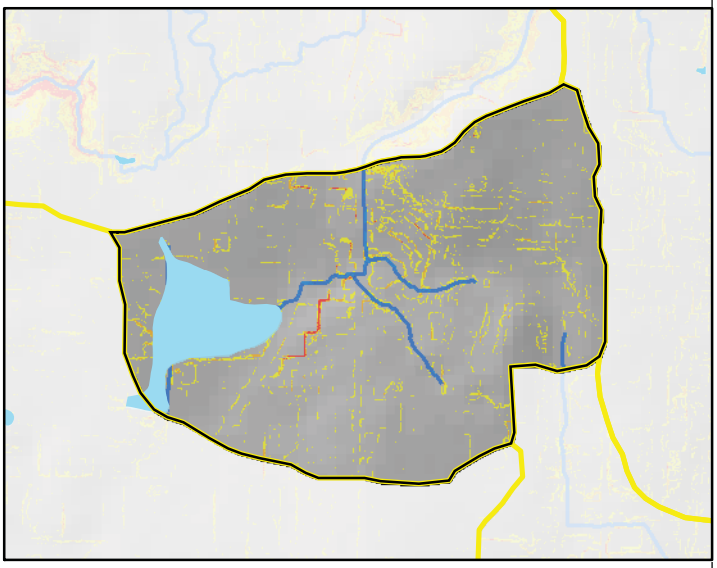




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lunds Gulch SE

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes are impaired.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	moderate
Recharge	high	low
Discharge	low	high

Key Management Strategies

Primary Focus: Delivery Process and Recharge

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has over 50% TIA and approximately 40 percent of the area is commercial and multifamily housing.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

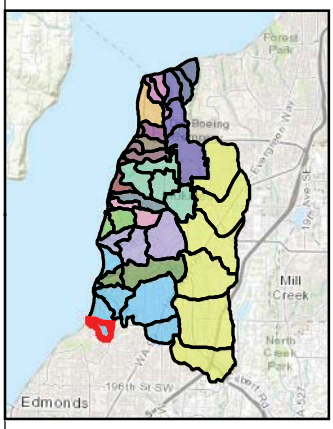
There are no known problems in this PAU.

Known Opportunities

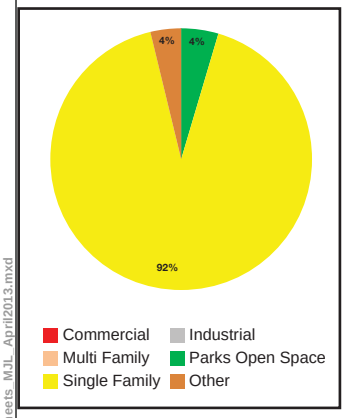
There are no known existing opportunities in this PAU.

Lunds Gulch SW

Watershed: Lunds Gulch
Management Category: Targeted Management Strategies
Priority: Low

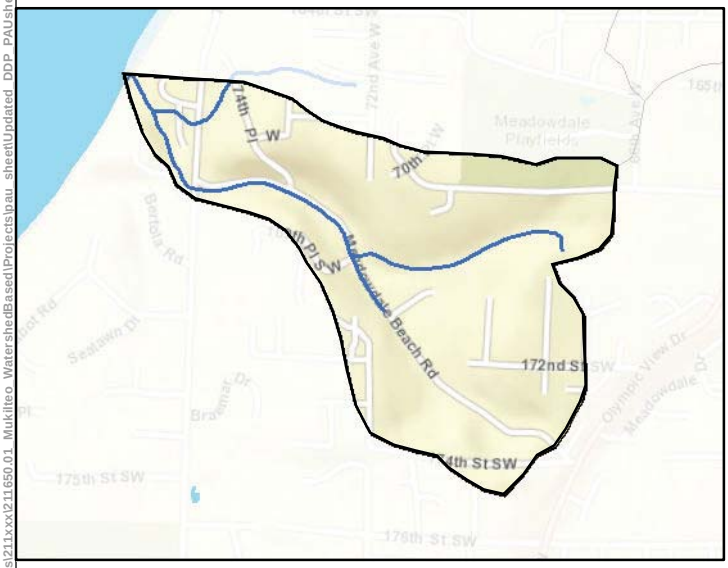


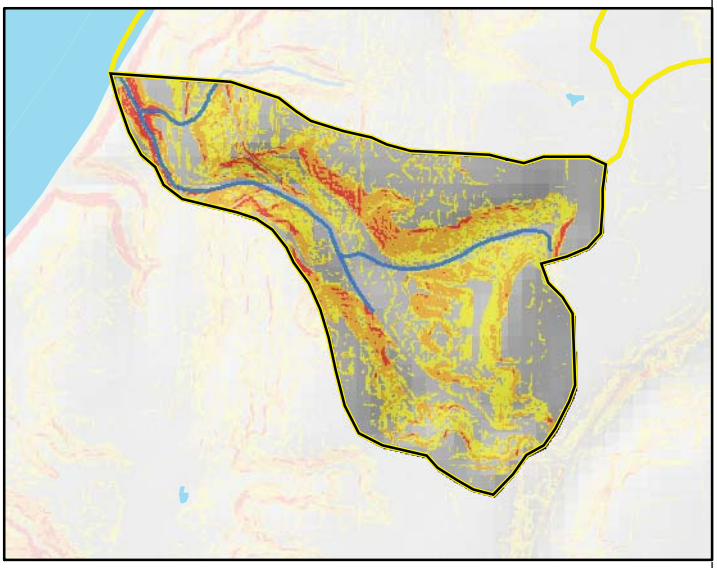
Area (acres): 132
% Impervious: 18%
% Wetland: 0.0%
Landscape Position: Ravine



Streams
Parcels
Parks
Waterbodies

0 250 500 1,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lunds Gulch SW

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep slope ravine; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 92% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

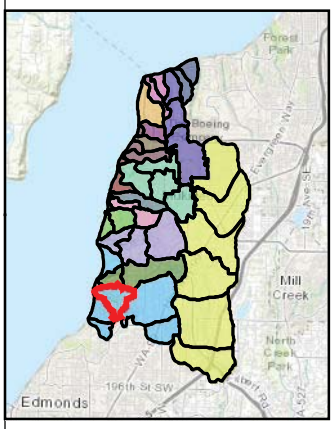
There are no known problems in this PAU.

Known Opportunities

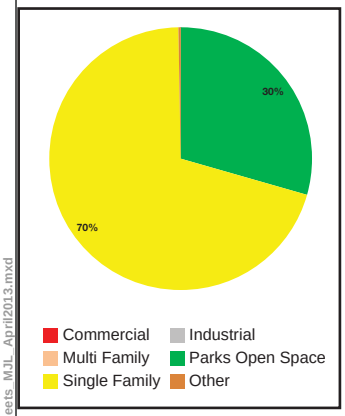
There are no known existing opportunities in this PAU.

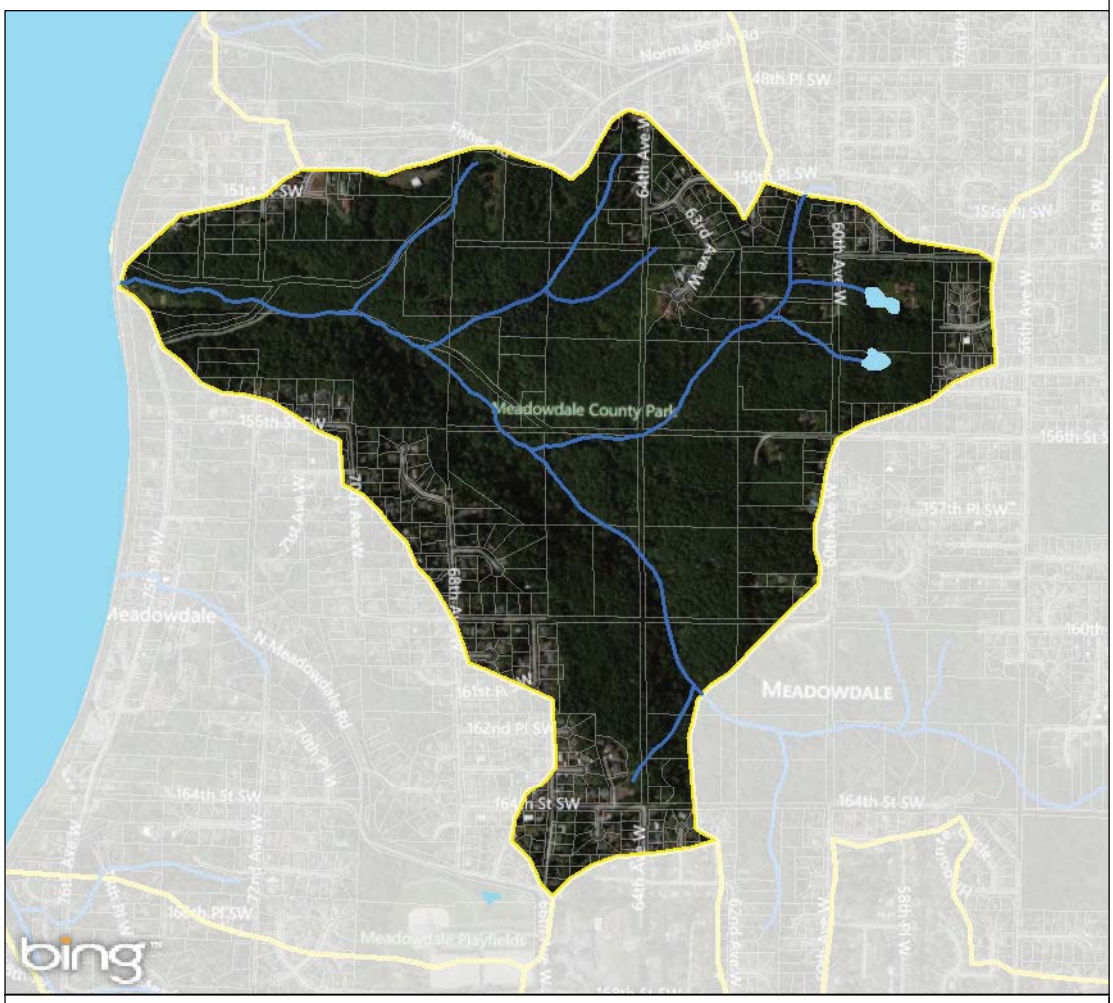
Lunds Gulch West

Watershed: Lunds Gulch
Management Category: Targeted Management Strategies
Priority: Moderate



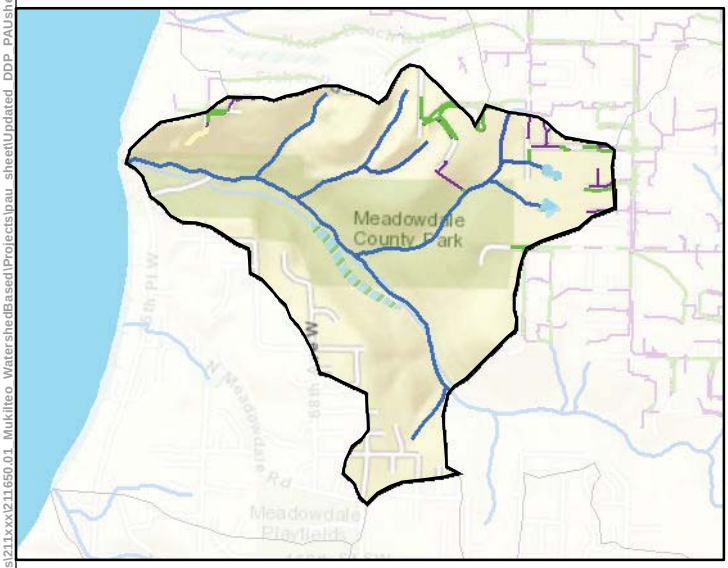
Area (acres): 359
% Impervious: 8%
% Wetland: 0.0%
Landscape Position: Ravine

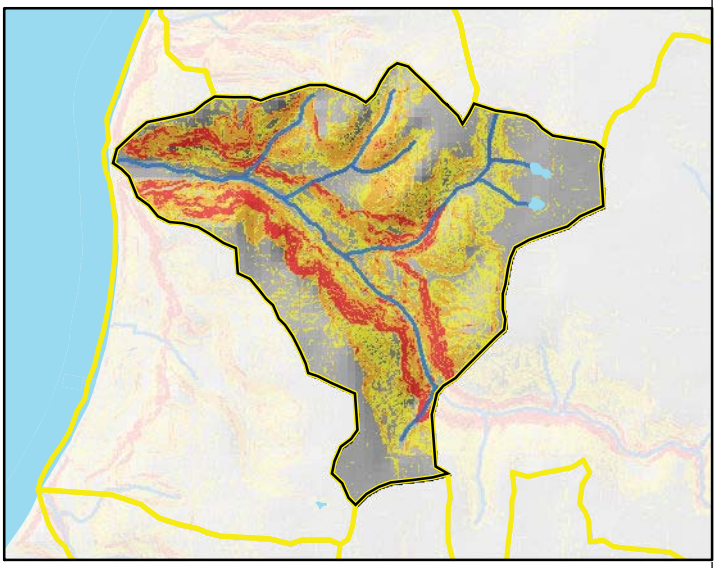




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Lunds Gulch West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process is relatively intact.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	high
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep slope ravine; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. This PAU has very low impervious surfaces; protection of existing vegetation is a recommended strategy in this PAU.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

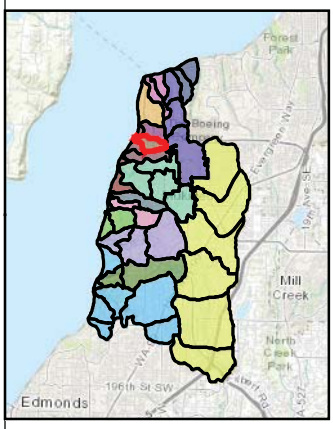
There are no known problems in this PAU.

Known Opportunities

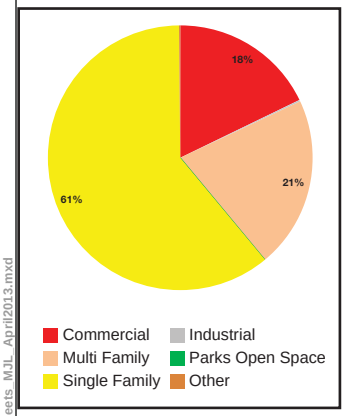
There are no known existing opportunities in this PAU.; however, 29% of this PAU is in parks and open space, which may provide opportunities.

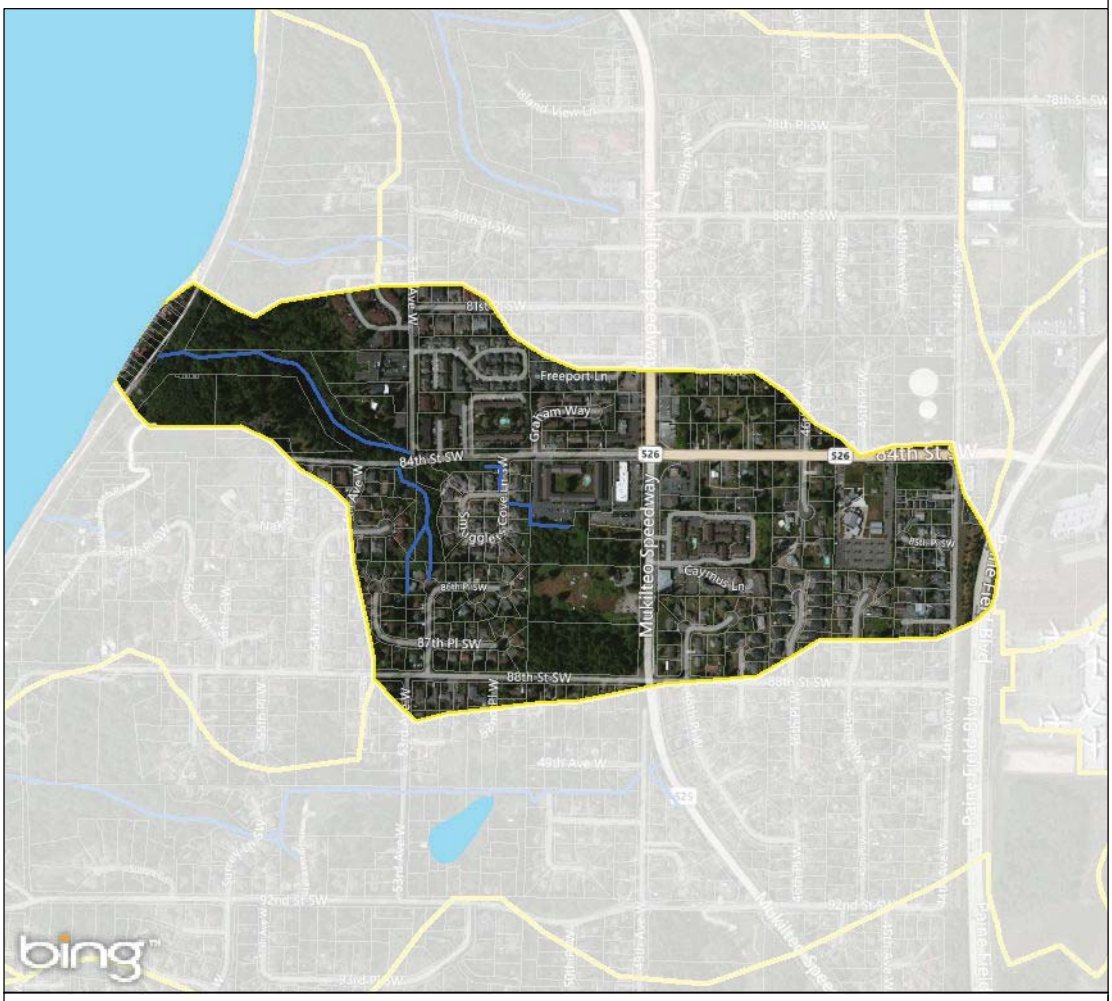
Naketa Beach

Watershed: Naketa Beach
Management Category: Targeted Management Strategies
Priority: Moderate



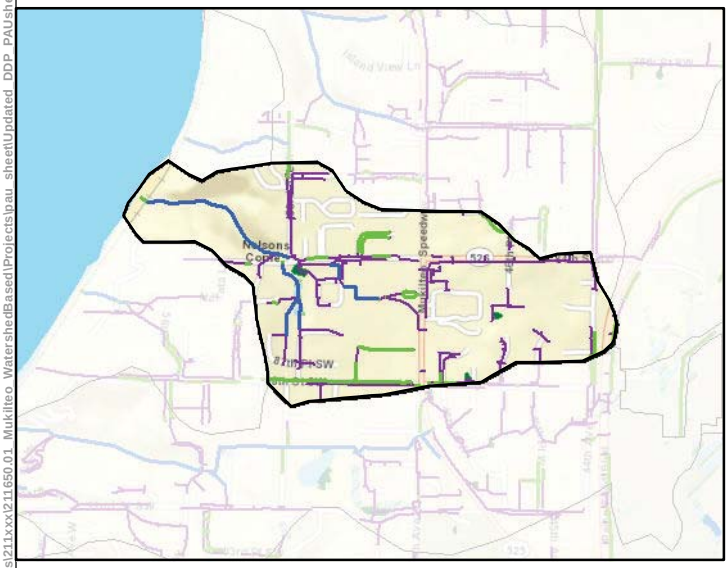
Area (acres): 160
% Impervious: 41%
% Wetland: 0.2%
Landscape Position: Ravine

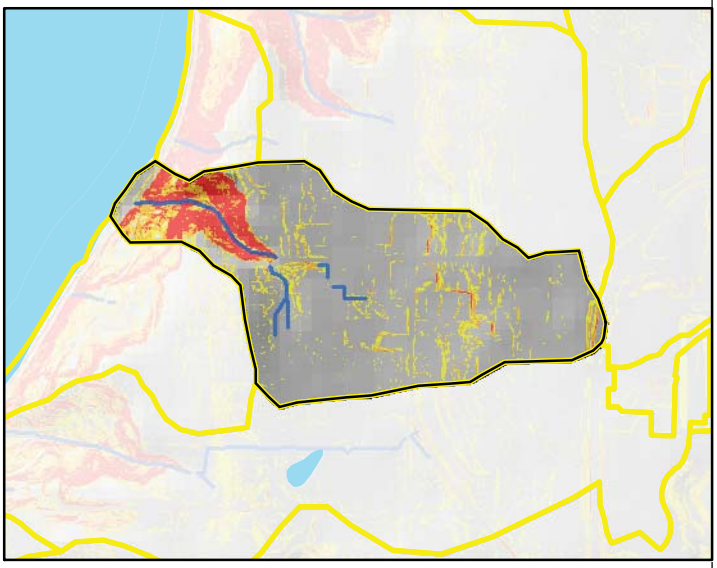




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Naketa Beach

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge	n/a	n/a
Discharge	low	moderate

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains both a steep coastal bluff and steep ravines; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

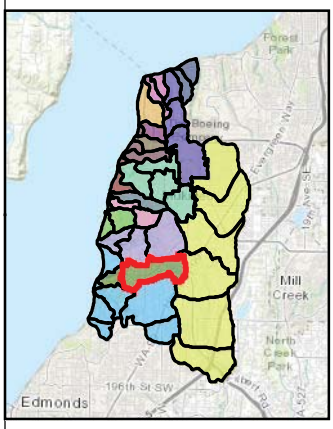
There are no known problems in this PAU.

Known Opportunities

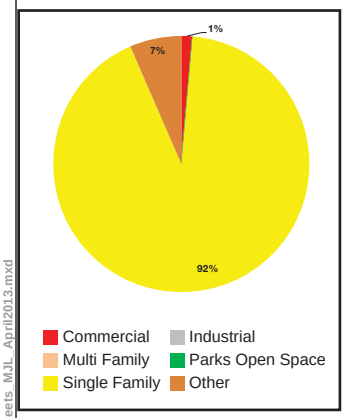
There are no known existing opportunities in this PAU.

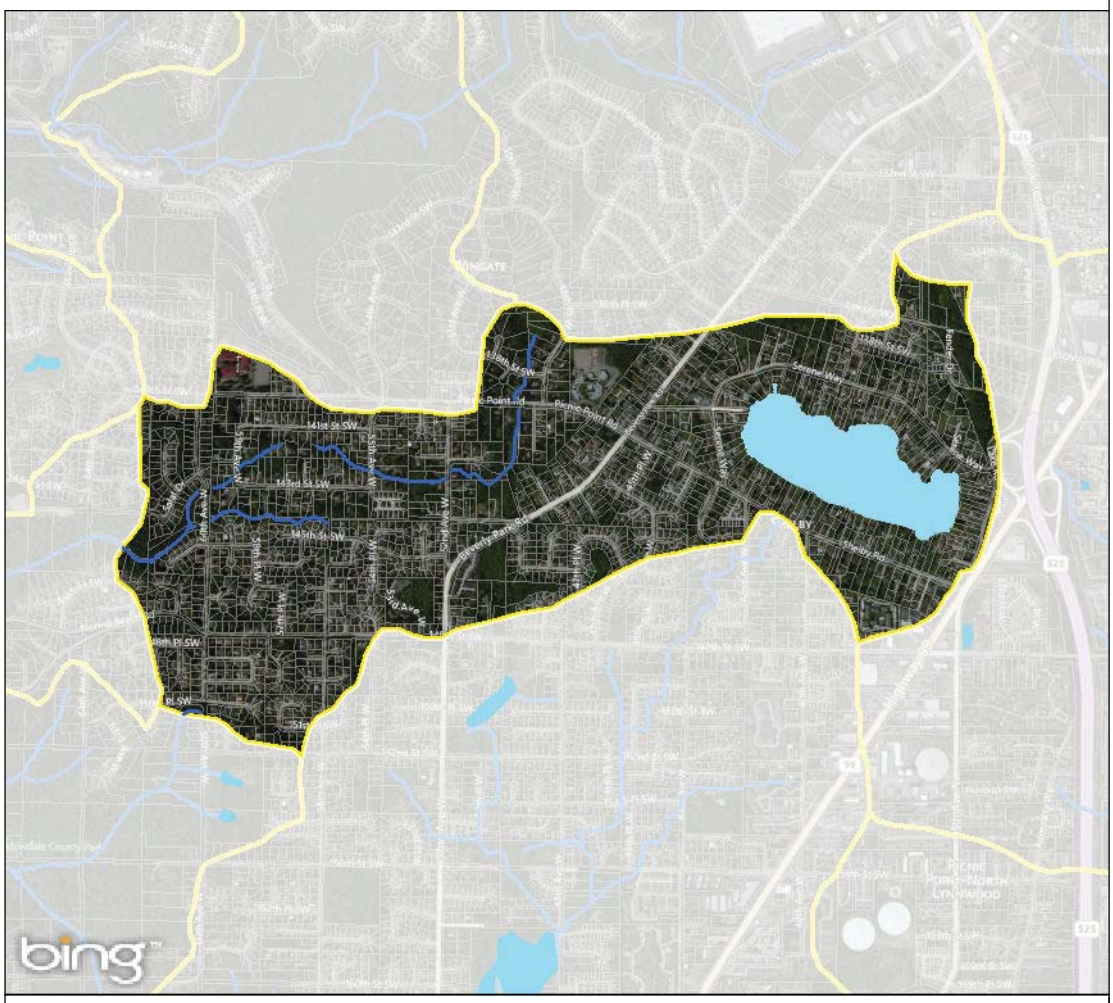
Norma Creek East

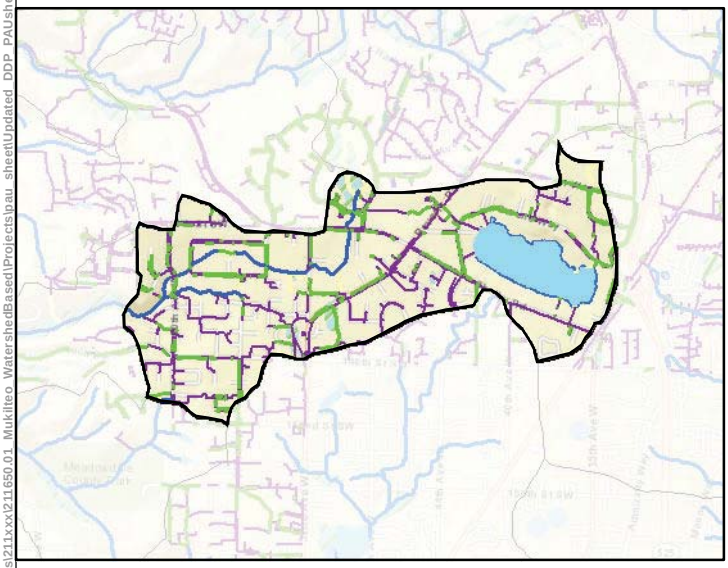
Watershed: Norma Creek
Management Category: Targeted Management Strategies
Priority: High

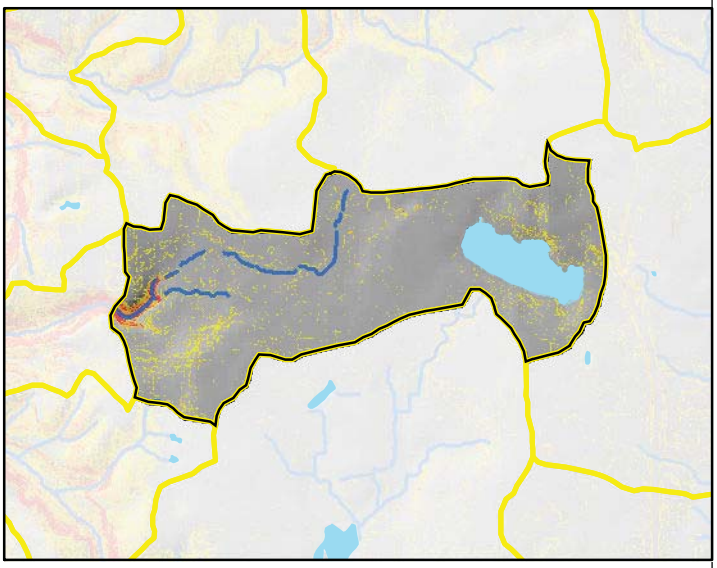


Area (acres): 666
% Impervious: 30%
% Wetland: 7.8%
Landscape Position: Plateau









Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Norma Creek East

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	moderate
Recharge	moderate	moderate
Discharge	low	low

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

There are no known constraints in this PAU. Approximately 92% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

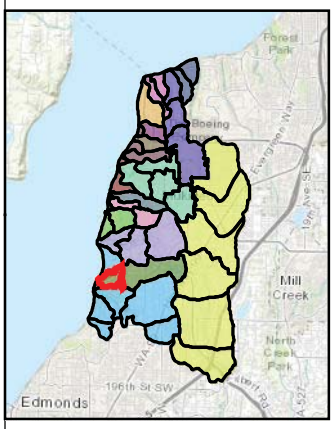
There are no known problems in this PAU.

Known Opportunities

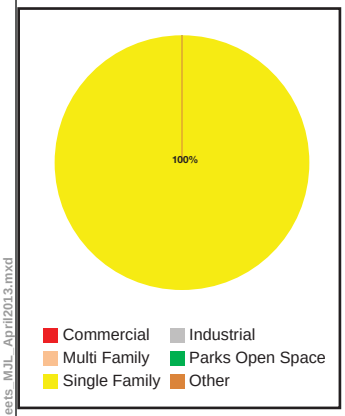
There are no known existing opportunities in this PAU.

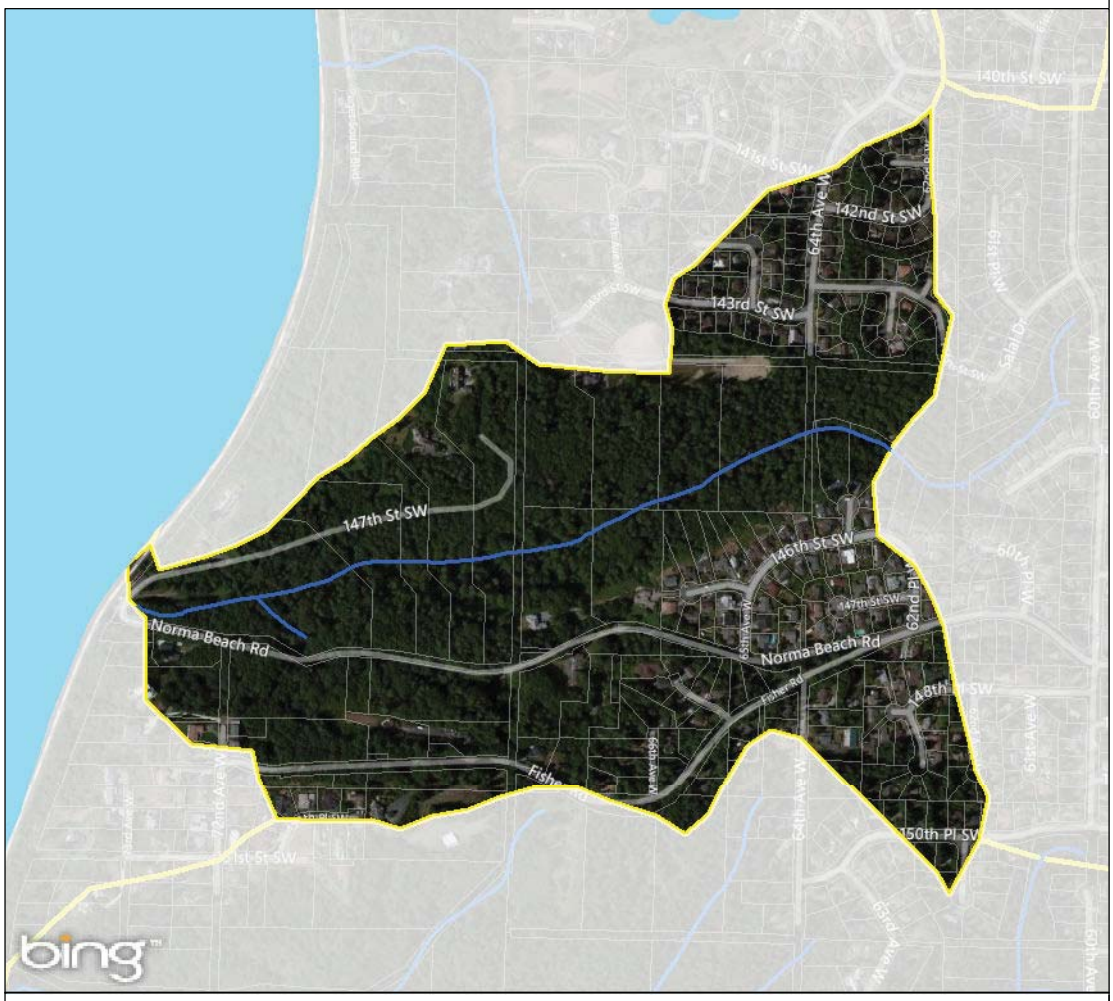
Norma Creek West

Watershed: Norma Creek
Management Category: Targeted Management Strategies
Priority: Low



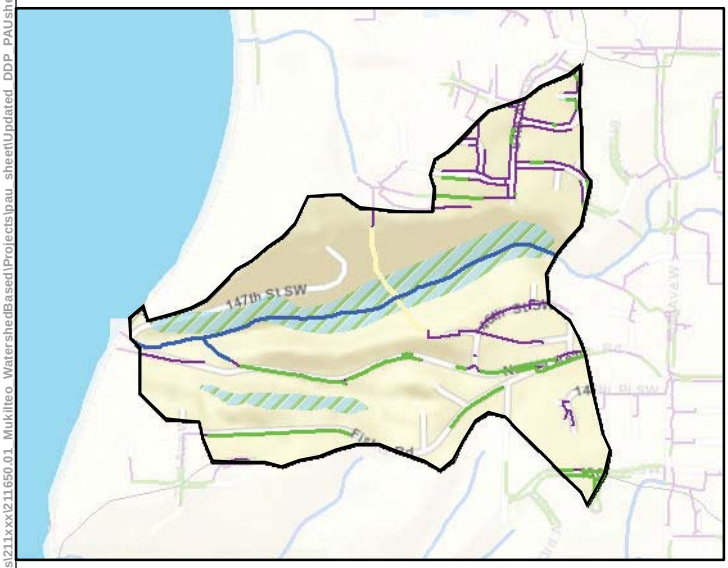
Area (acres): 168
% Impervious: 15%
% Wetland: 0.1%
Landscape Position: Ravine

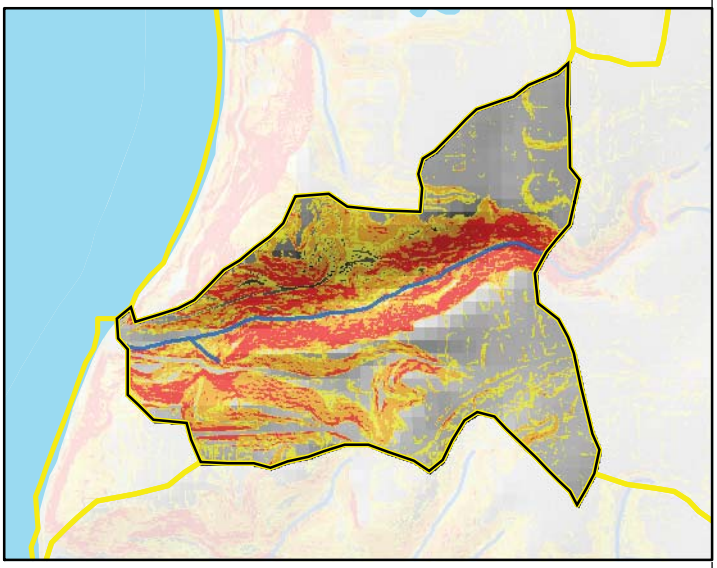




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Norma Creek West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process and Water Quality

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	Protect/acquire open space
Constructed wetlands	**Plant trees**	Restore upland revegetation
Restore depressional wetlands	**Rain gardens**	Restore buffer vegetation
Permeable pavement	**Vegetated filter strips**	
Bioretention cells and planters	**Disconnect downspouts**	
Bioretention swale		

***Bold font** indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

Much of the land in this PAU is located in a well vegetated steep ravine. Use of strategies that infiltrate runoff will be limited/ prohibited in these areas due to risks of landslides. Approximately 100% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has stream segments on the 303(d) list for exceeding fecal coliform criteria.

Known Problems

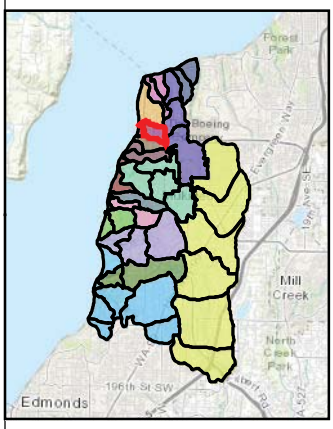
There are no known problems in this PAU.

Known Opportunities

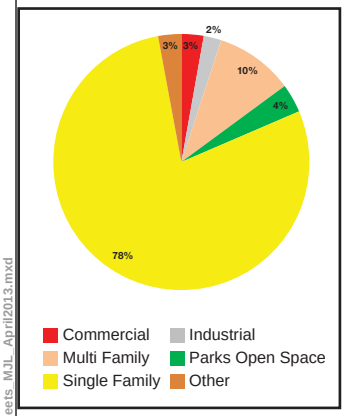
There are no known existing opportunities in this PAU.

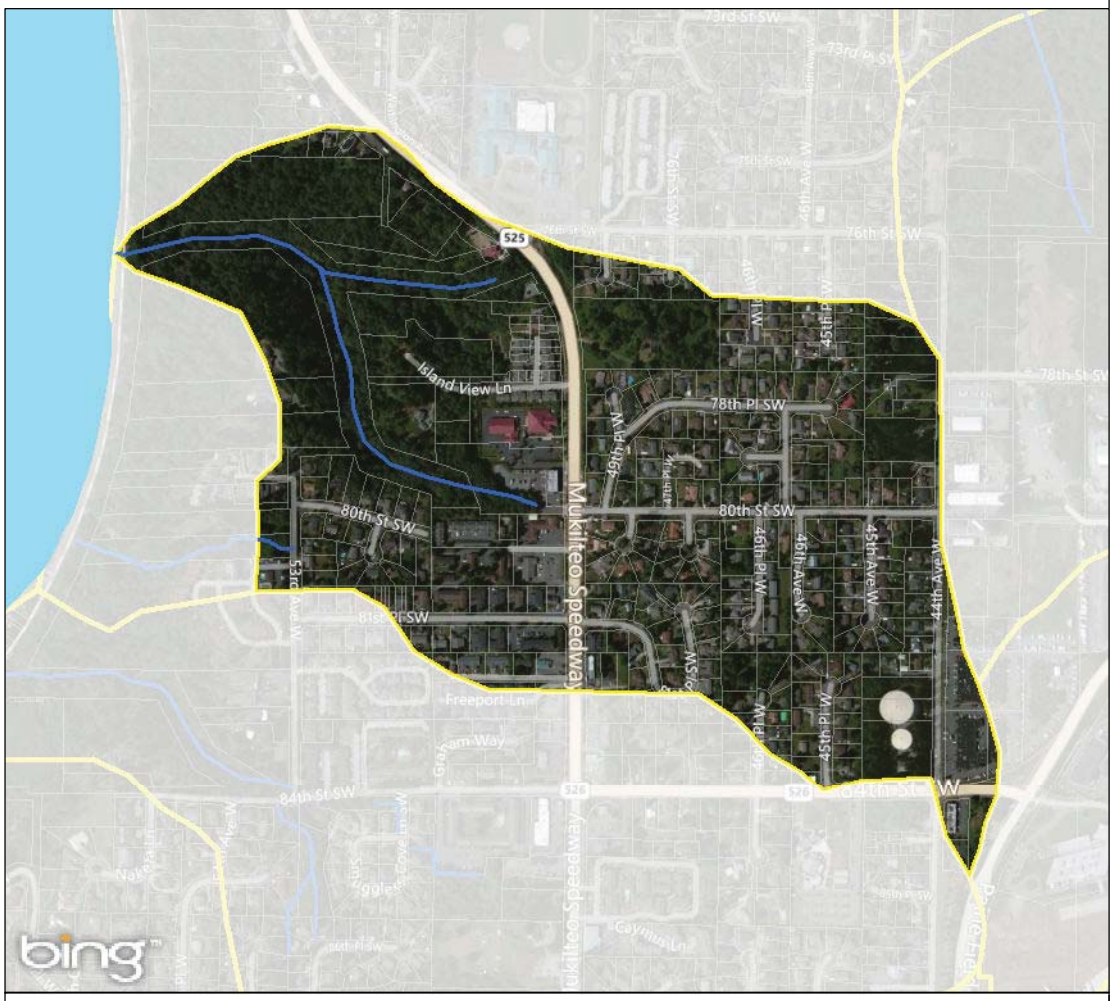
Olympic View South

Watershed: Olympic View
Management Category: Targeted Management Strategies
Priority: Low



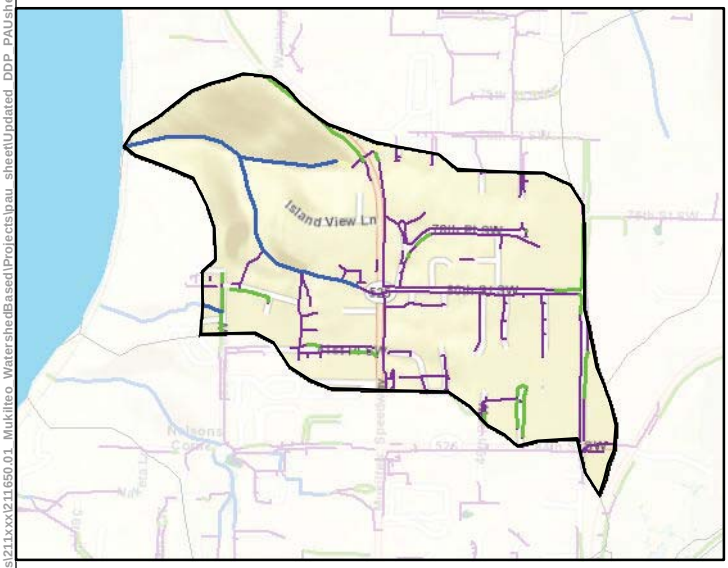
Area (acres): 173
% Impervious: 32%
% Wetland: 0.0%
Landscape Position: Ravine

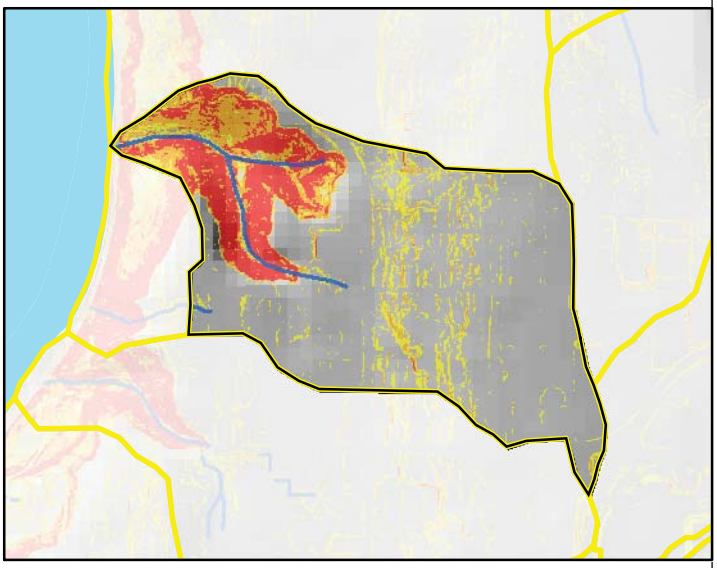




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Olympic View South

Key Watershed Processes

Delivery is a key process within these PAUs. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains both a steep coastal bluff and steep ravines; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

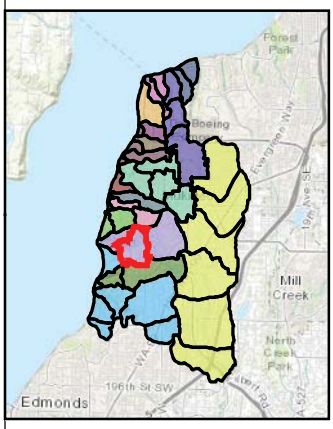
There are no known problems in this PAU.

Known Opportunities

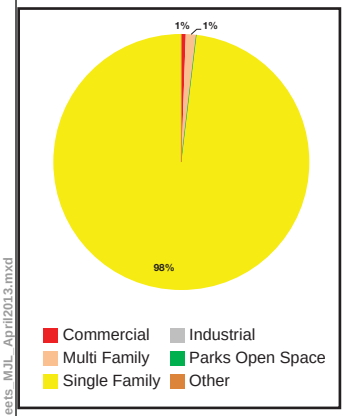
There are no known existing opportunities in this PAU.

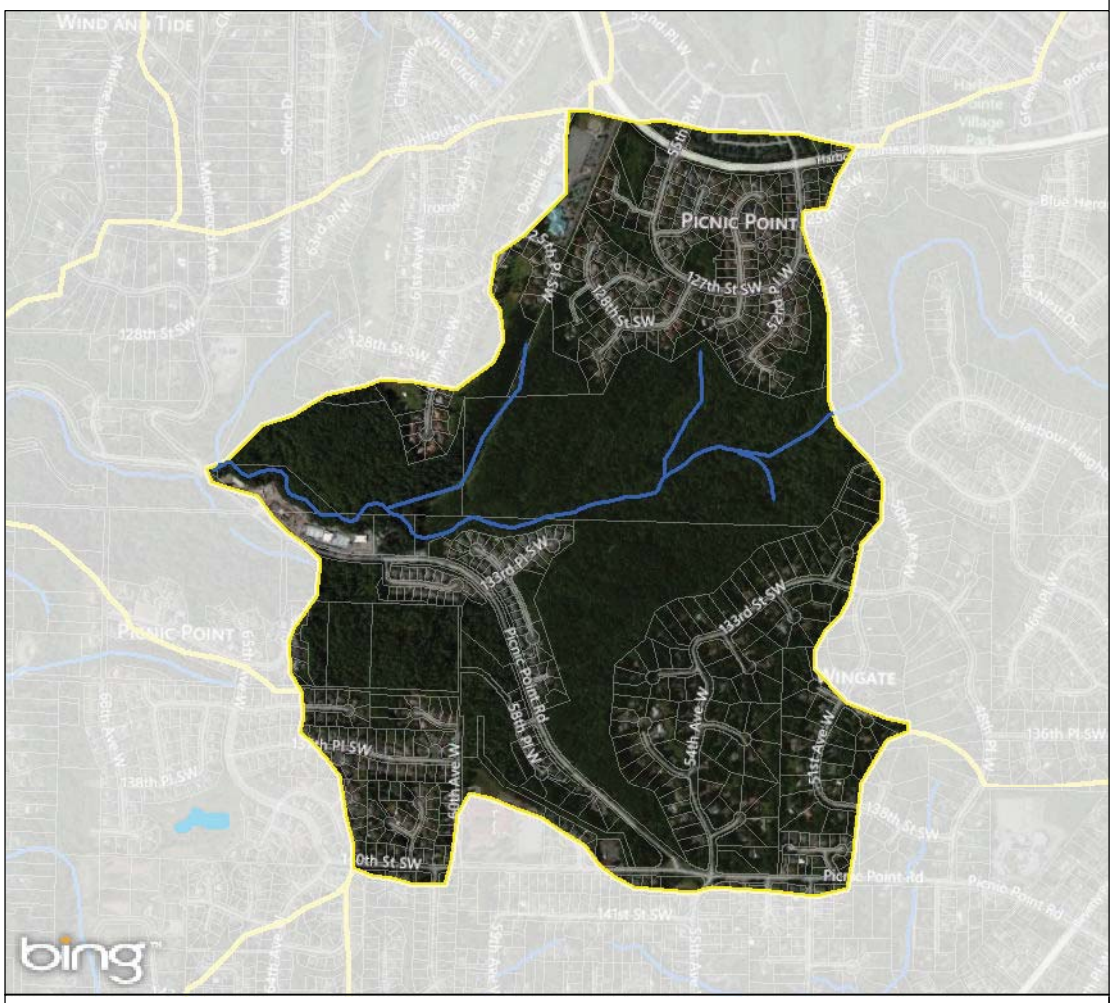
Picnic Point Ravine

Watershed: Picnic Point Ravine
Management Category: Targeted Management Strategies
Priority: High



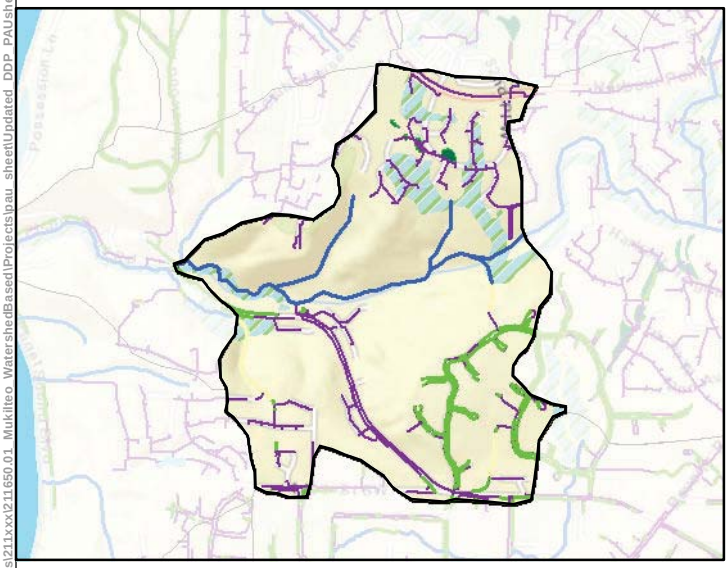
Area (acres): 441
% Impervious: 16%
% Wetland: 2.0%
Landscape Position: Ravine

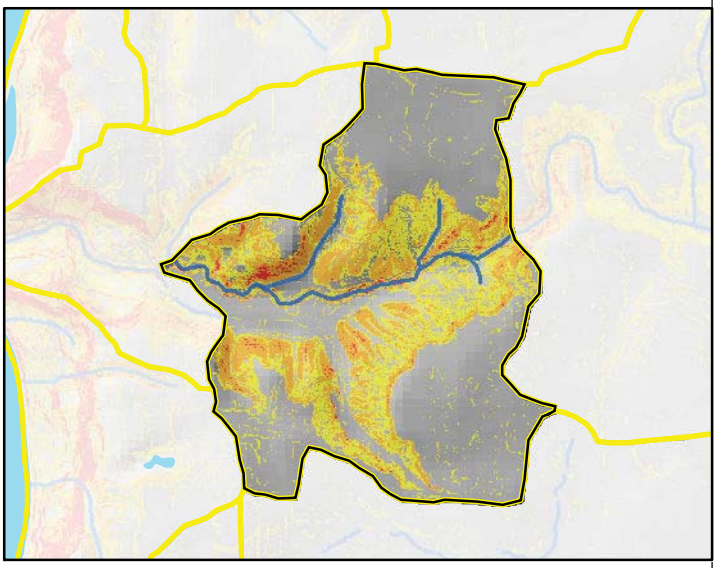




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Picnic Point Ravine

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains both a steep coastal bluff and steep ravines; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

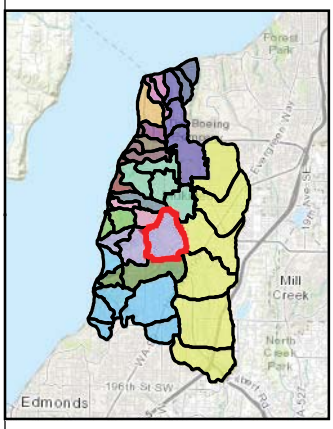
There are no known problems in this PAU.

Known Opportunities

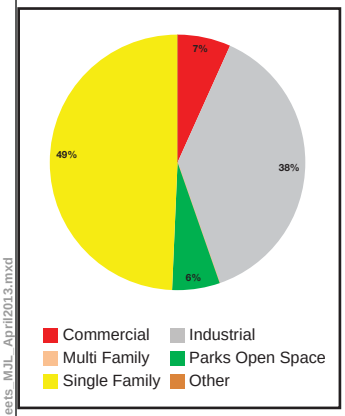
The CAMP report identified one regional mitigation site within this PAU: M10.

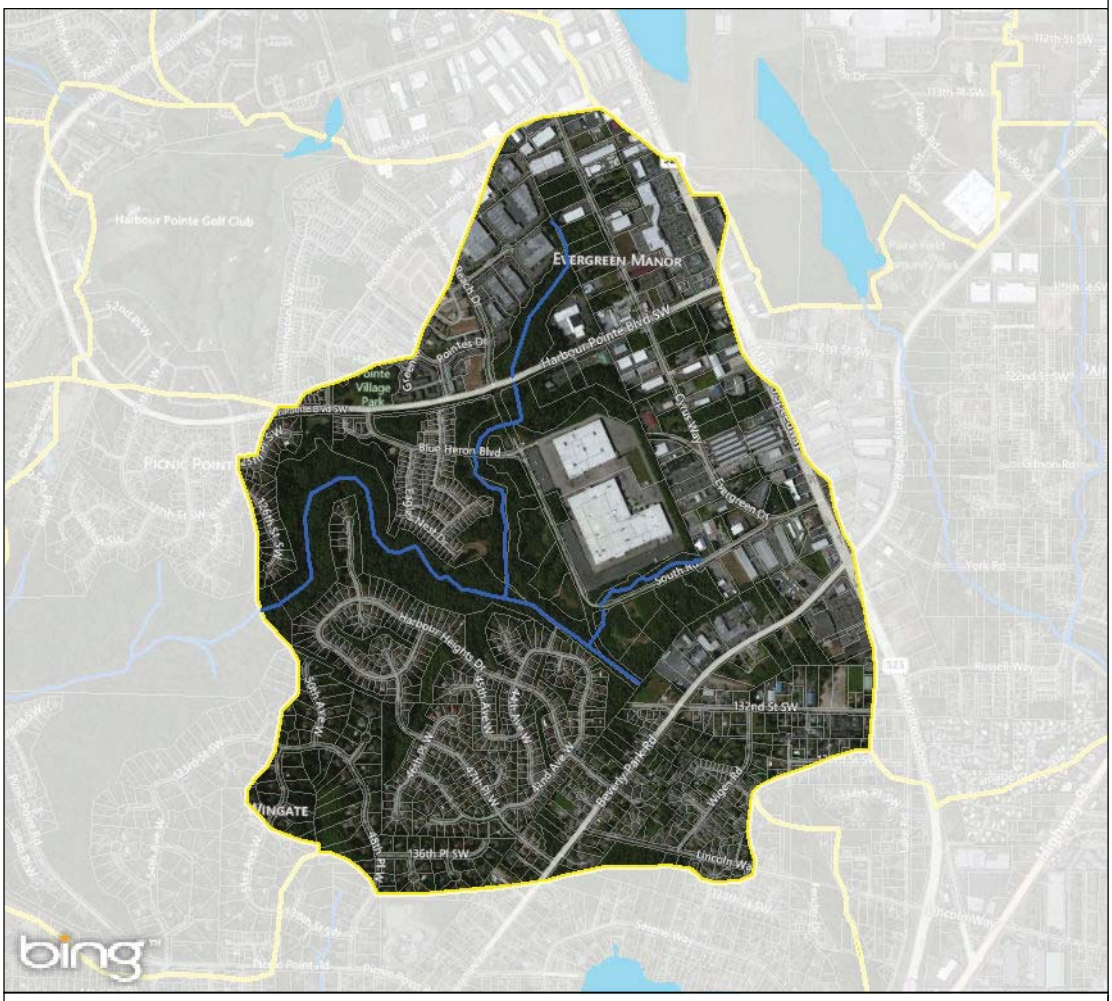
Picnic Point Ravine East

Watershed: Picnic Point Ravine
Management Category: Targeted Management Strategies
Priority: Moderate



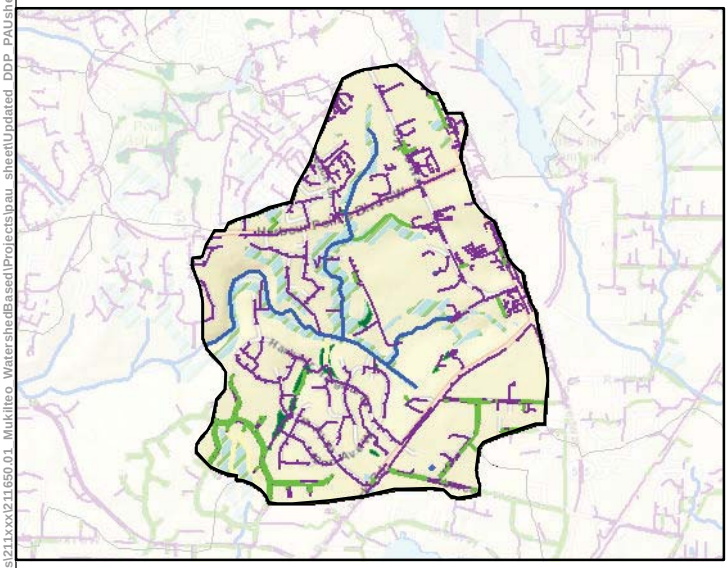
Area (acres): 747
% Impervious: 40%
% Wetland: 4.7%
Landscape Position: Plateau

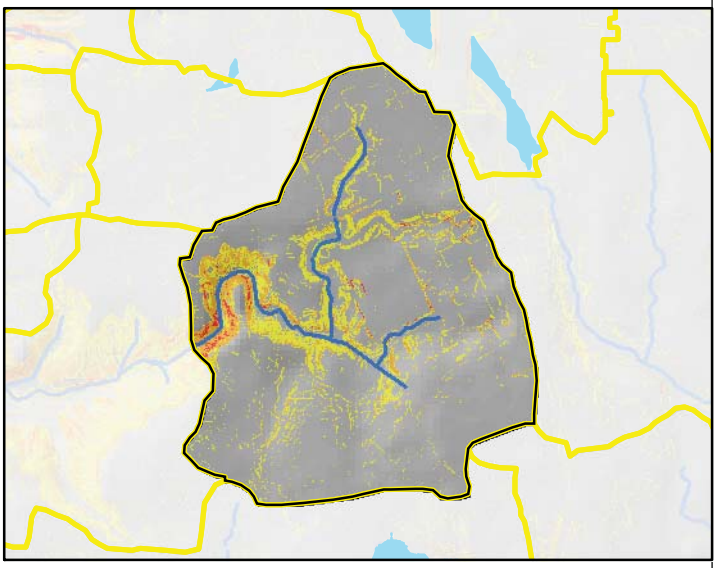




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Picnic Point Ravine East

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention cells and planters	**Plant trees**	Restore upland revegetation
Bioretention swale	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has 40% TIA and approximately 40% of the area is in industrial uses; which may limit infiltration

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

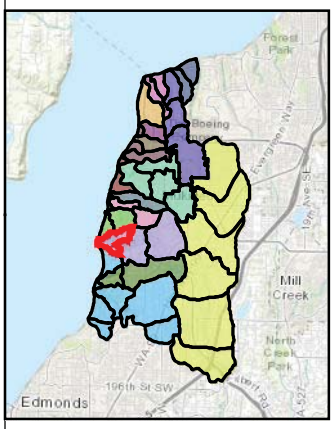
There are no known problems in this PAU.

Known Opportunities

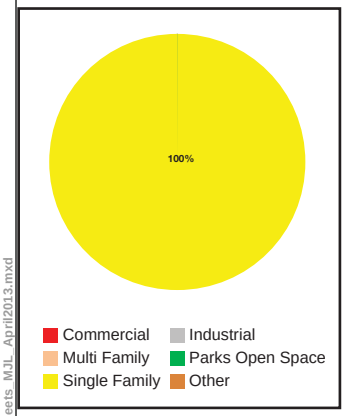
The CAMP report identified one regional mitigation site within this PAU: M8.

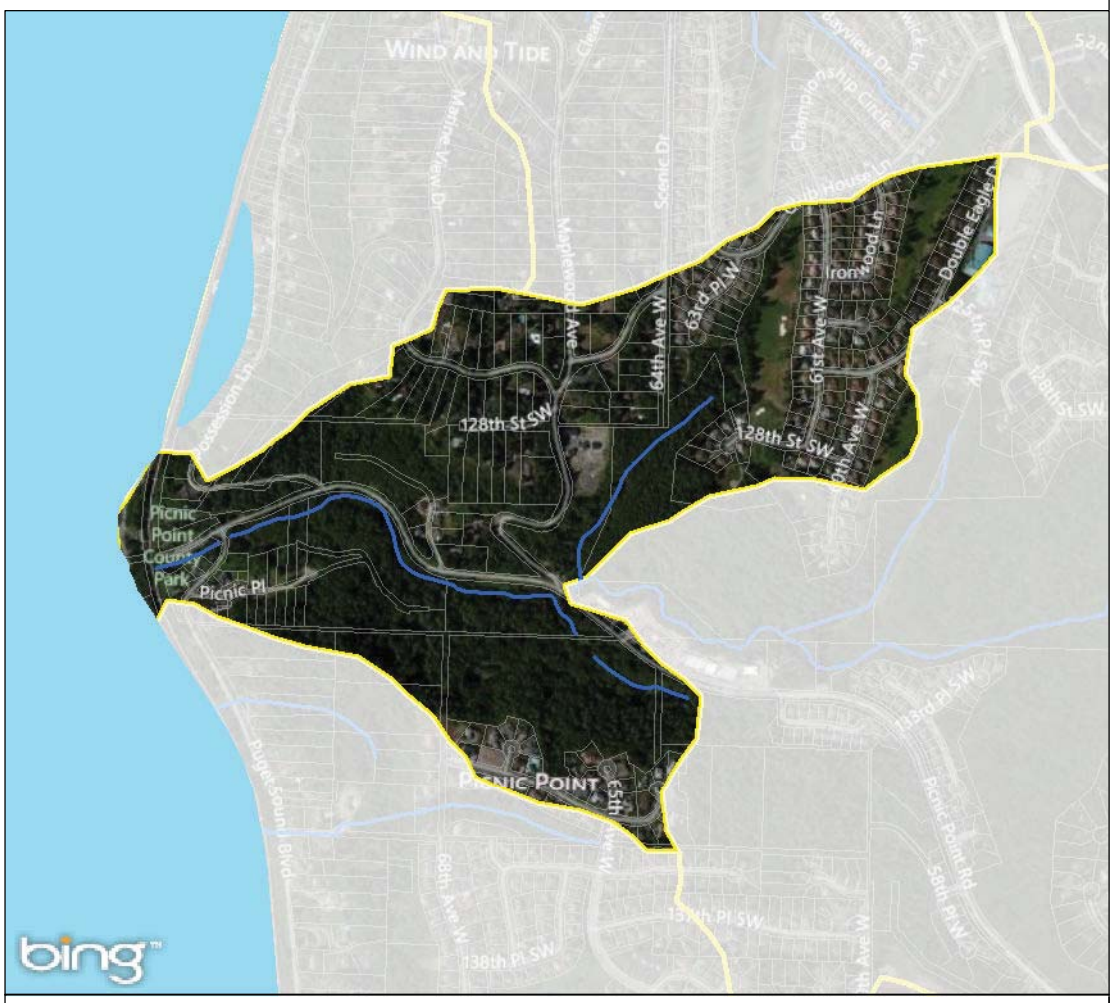
Picnic Point Ravine West

Watershed: Picnic Point Ravine
Management Category: Targeted Management Strategies
Priority: Moderate



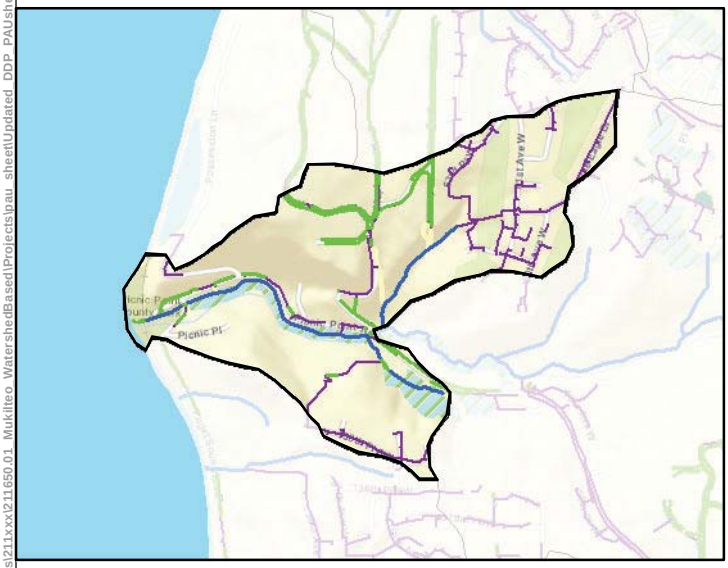
Area (acres): 229
% Impervious: 15%
% Wetland: 0.2%
Landscape Position: Ravine

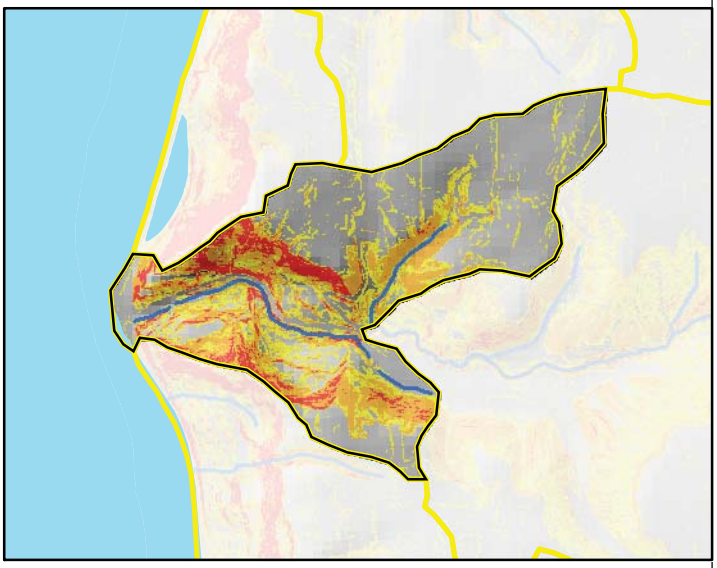




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Picnic Point Ravine West

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains both a steep coastal bluff and steep ravines; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

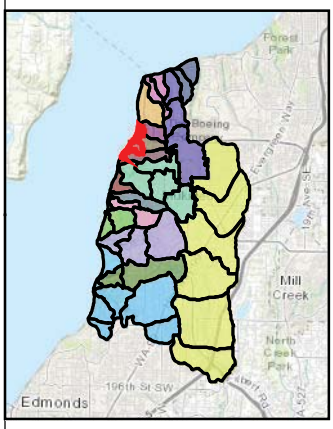
There are no known problems in this PAU.

Known Opportunities

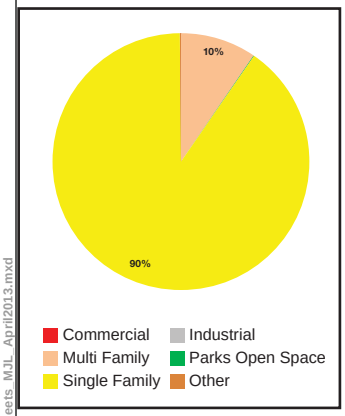
There are no known existing opportunities in this PAU.

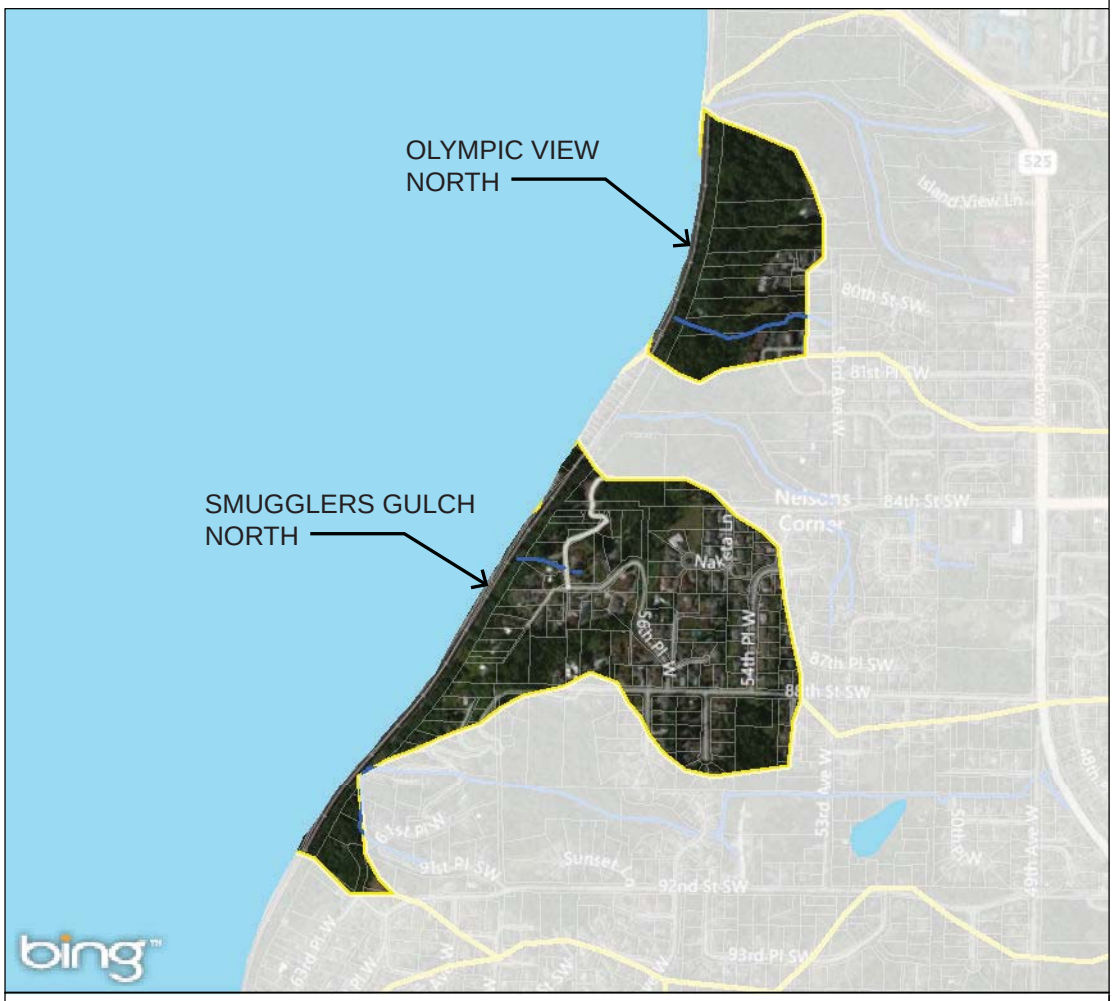
Smugglers Gulch N/ Olympic View N

Watershed: Smugglers Gulch
Management Category: Targeted Management Strategies
Priority: Moderate



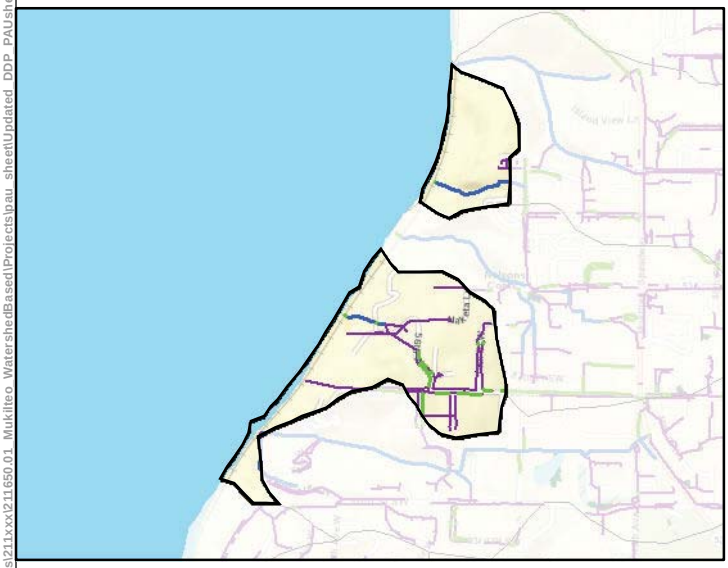
Area (acres): 112
% Impervious: 23%
% Wetland: 0.0%
Landscape Position: Bluff

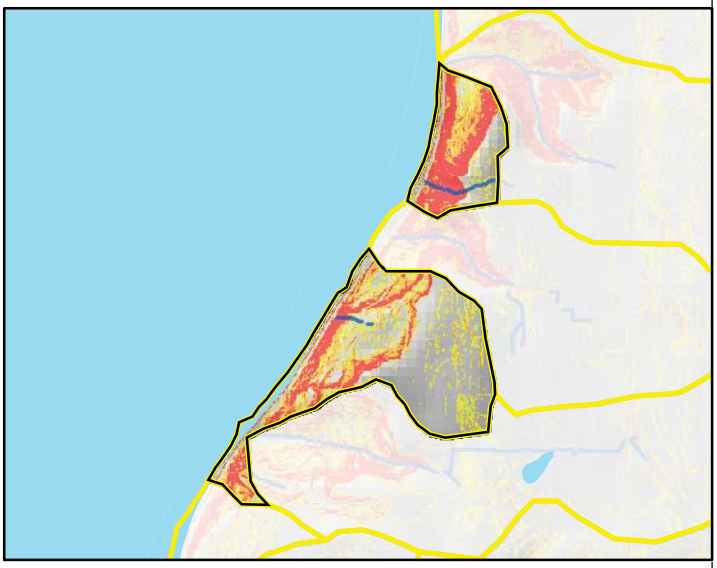




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Smugglers Gulch North and Olympic View North

Key Watershed Processes

Delivery is a key process within these PAUs. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for these PAUs*

Constraints/Existing Land Use

These PAUs contain a steep coastal bluff; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 90% of the PAUs is residential development; therefore on-site strategies may be most effective.

Water Quality

These PAUs have no state impaired water quality listings.

Known Problems

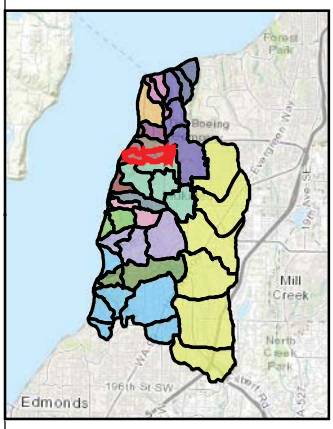
There are no known problems in these PAUs.

Known Opportunities

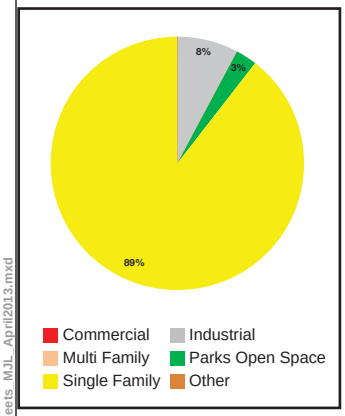
See Pre-Design Report for projects.

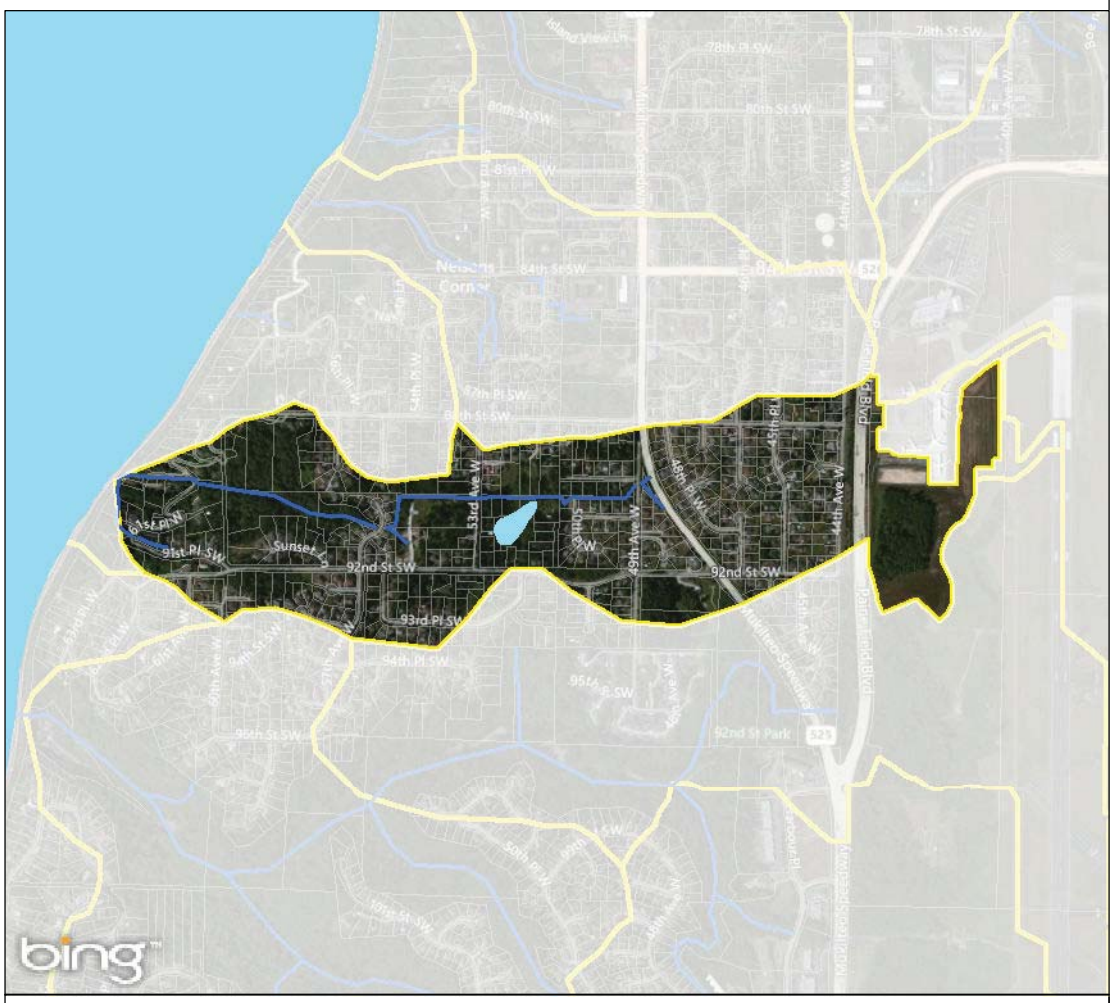
Smugglers Gulch South

Watershed: Smugglers Gulch
Management Category: Targeted Management Strategies
Priority: Moderate



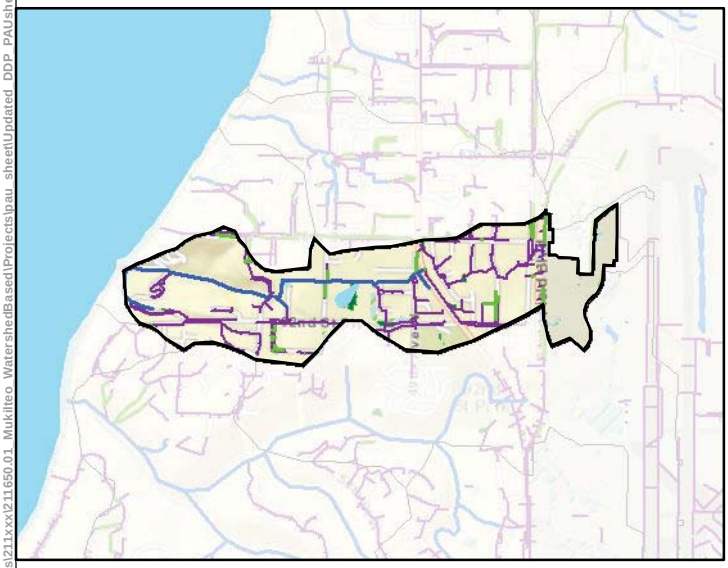
Area (acres): 220
% Impervious: 26%
% Wetland: 1.8%
Landscape Position: Ravine

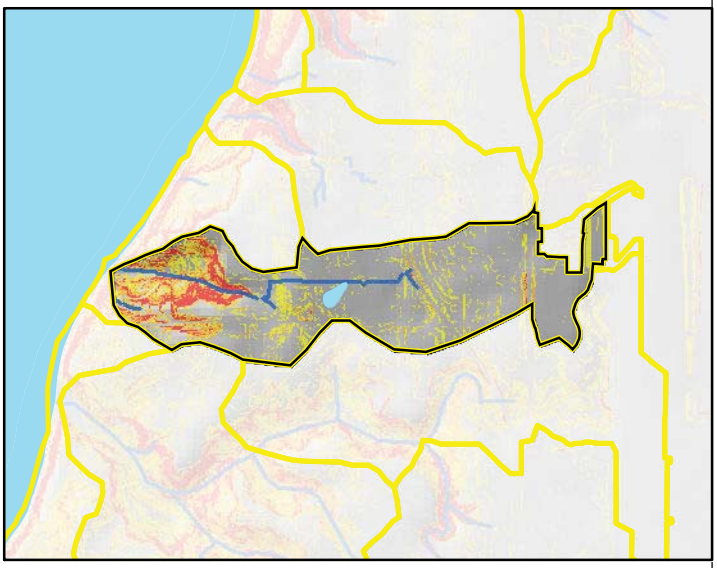




Streams
Waterbodies
Parcels
Parks

0 250500 1,000 1,500 2,000
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Smugglers Gulch South

Key Watershed Processes

Deliveryis a key processes within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	moderate
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	moderate

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU contains a steep ravine; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides. Approximately 90% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

There are two known problems in this PAU:

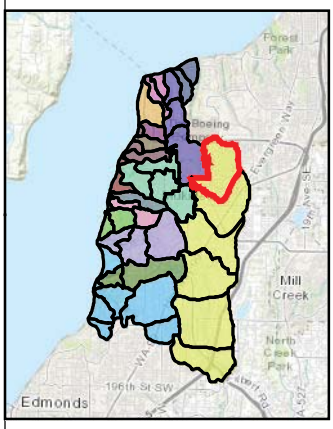
1. The homes located along the north side of 92nd are impacted by flooding due to excessive flows and flat topography.
2. There is excessive erosion and landslides in the stream west of 53rd and frequent problems with a culvert that is plugged during storm events.

Known Opportunities

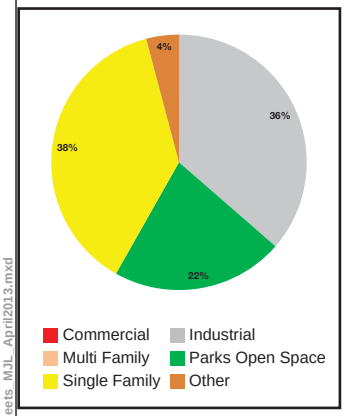
The CAMP report identified two regional mitigation site within this PAU: M3 and M4. Also see Pre-Design Report for projects.

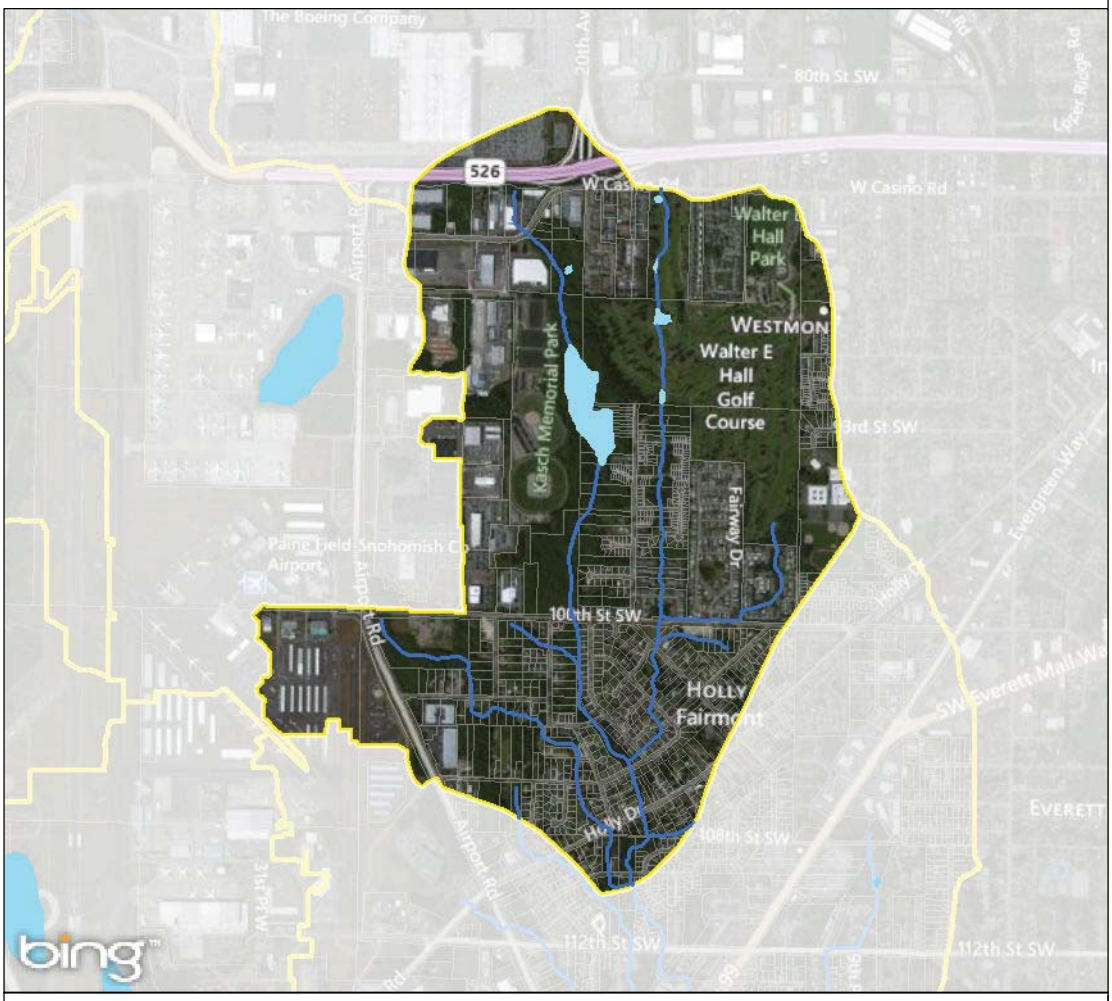
Swamp Creek A

Watershed: Swamp Creek
Management Category: Targeted Management Strategies
Priority: High



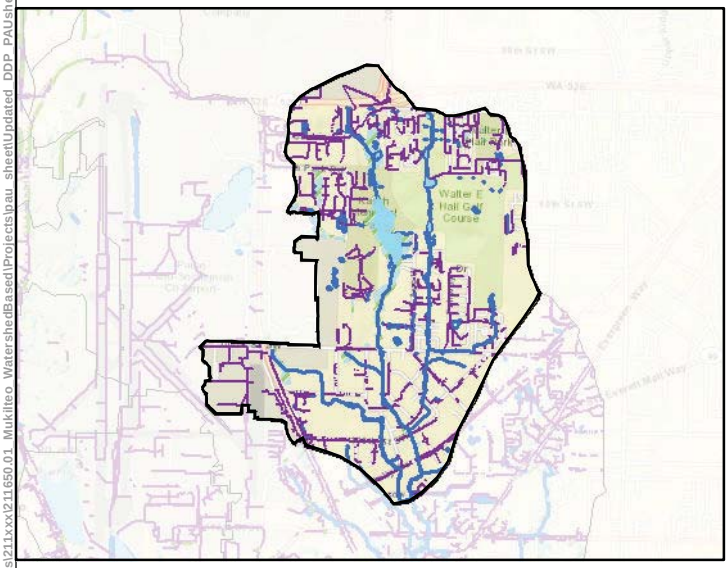
Area (acres): 958
% Impervious: 39%
% Wetland: 4.7%
Landscape Position: Plateau

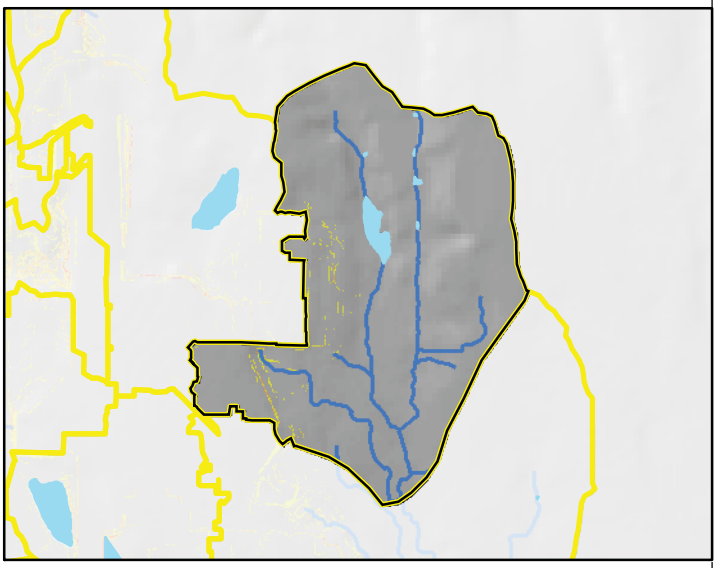




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 3,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Swamp Creek A

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge	high	moderate
Discharge	low	high

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
Bioretention cells and planters	**Rain gardens**	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has approximately 40% TIA and approximately 37% of the area is in industrial uses; which may limit infiltration.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

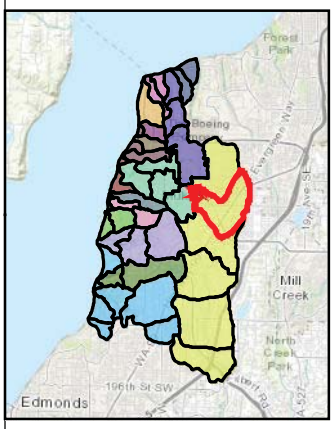
There are no known problems in this PAU.

Known Opportunities

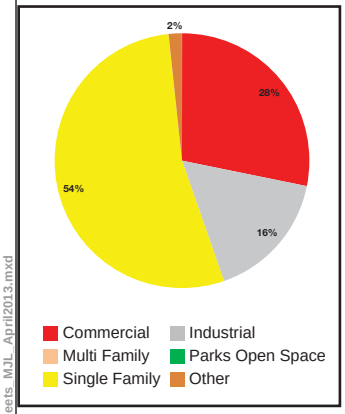
There are no known existing opportunities in this PAU.; however, 22% of this PAU is in parks and open space, which may provide opportunities.

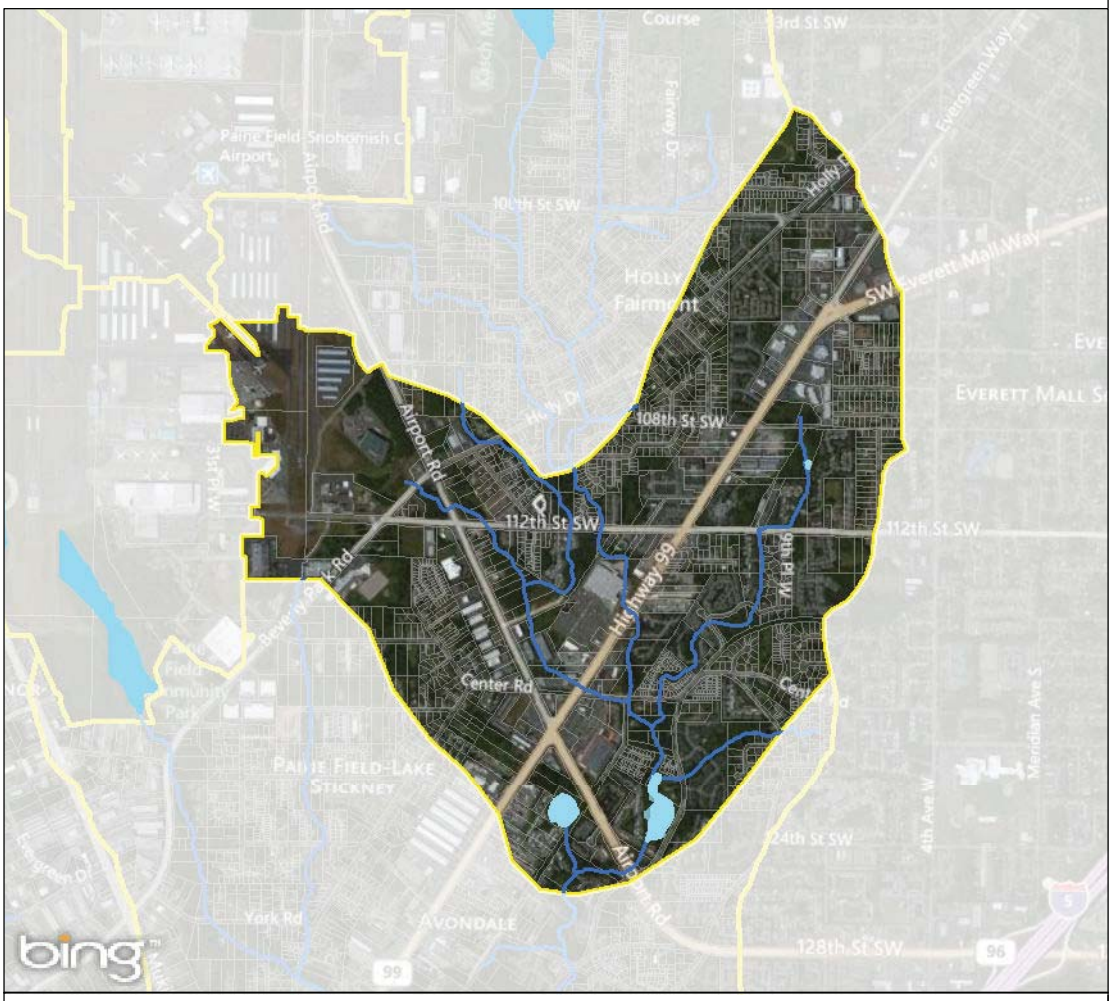
Swamp Creek C

Watershed: Swamp Creek
Management Category: Targeted Management Strategies
Priority: High



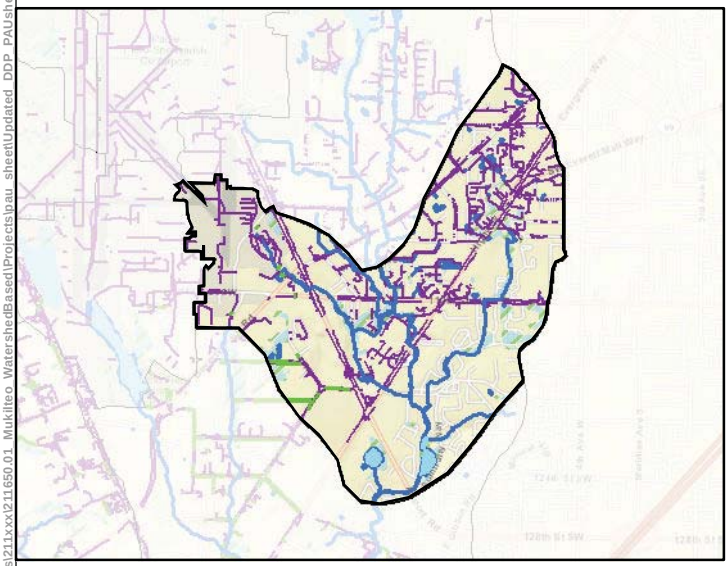
Area (acres): 933
% Impervious: 53%
% Wetland: 6.5%
Landscape Position: Plateau

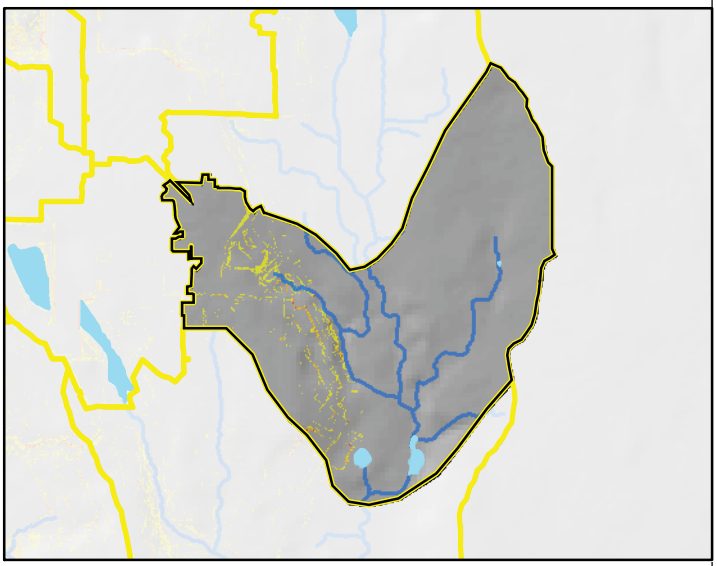




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500 Feet





Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Swamp Creek C

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	moderate
Recharge	high	low
Discharge	low	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes and Water Quality

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	Protect/acquire open space
Constructed wetlands	**Plant trees**	Restore upland revegetation
Restore depressional wetlands	**Rain gardens**	Restore buffer vegetation
Permeable pavement	**Vegetated filter strips**	
Bioretention cells and planters	**Disconnect downspouts**	
Bioretention swale		

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has over 50% TIA.

Water Quality

This PAU has stream segments on the 303(d) list for exceeding fecal coliform and dissolved oxygen criteria.

Known Problems

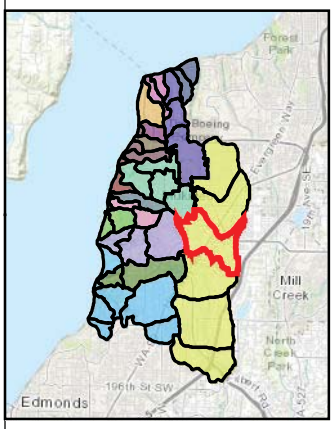
There are no known problems in this PAU.

Known Opportunities

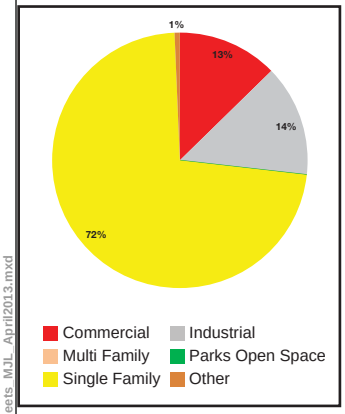
There are no known existing opportunities in this PAU.

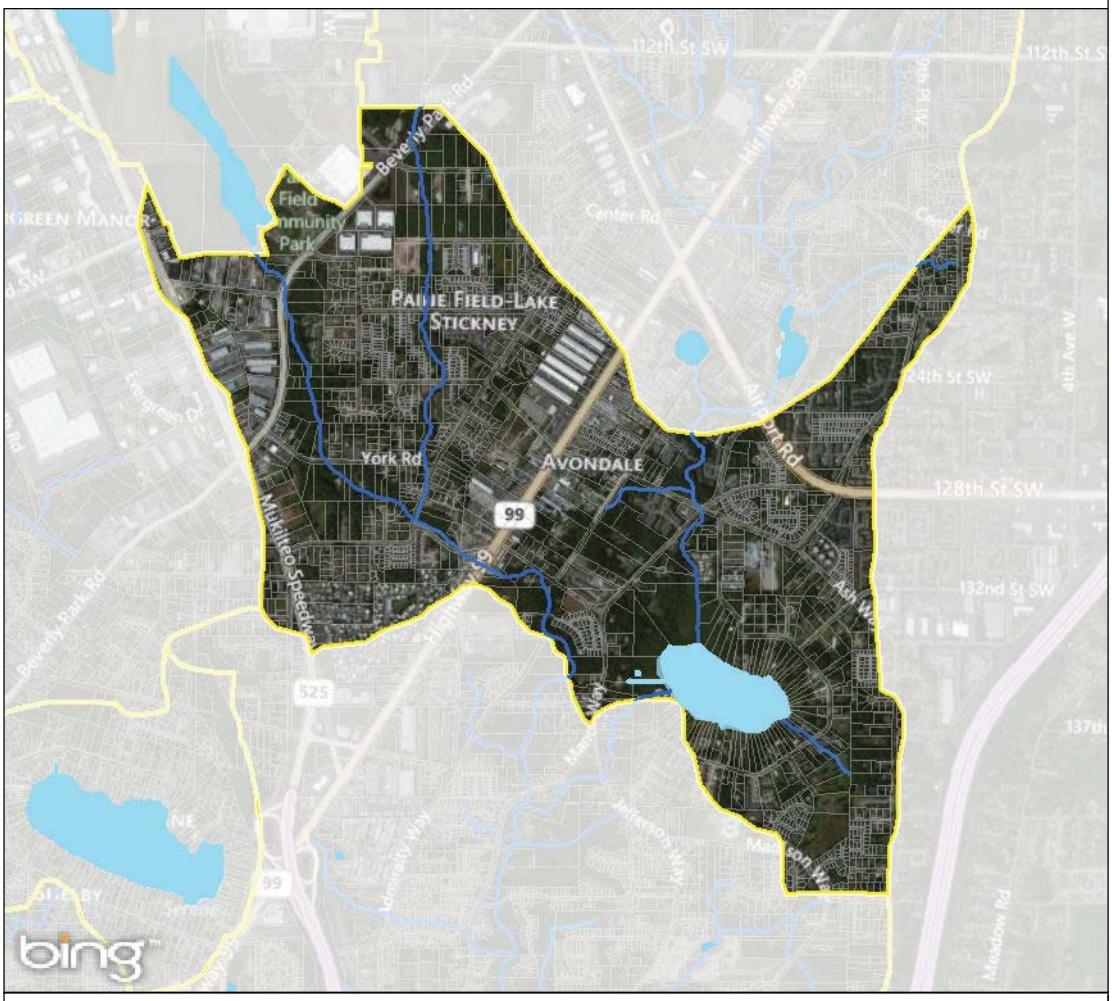
Swamp Creek D

Watershed: Swamp Creek
Management Category: Targeted Management Strategies
Priority: High



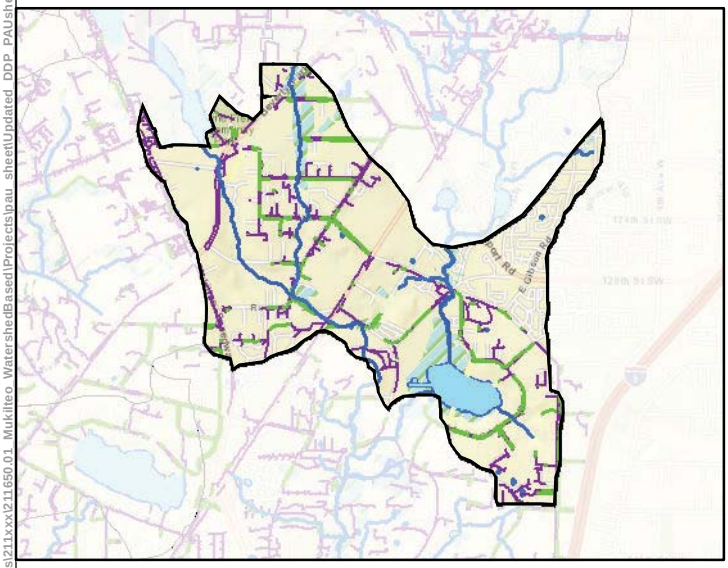
Area (acres): 977
% Impervious: 42%
% Wetland: 7.8%
Landscape Position: Plateau

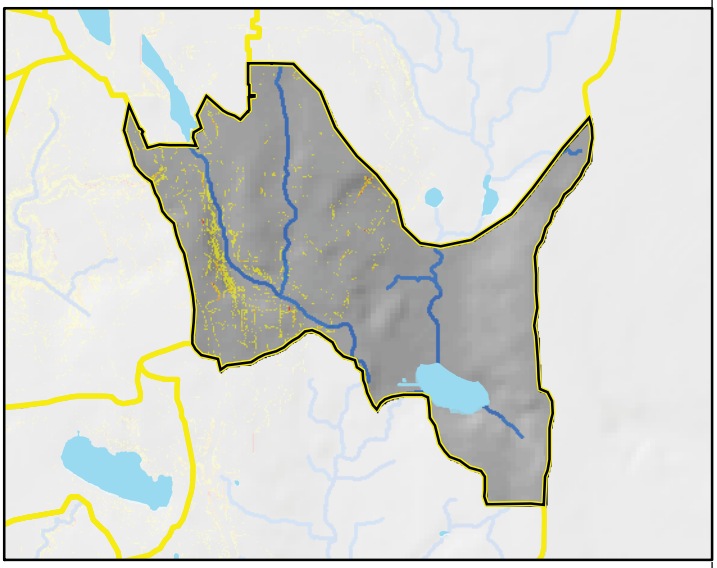




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 3,000
Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Swamp Creek D

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	moderate	low
Recharge	high	moderate
Discharge	low	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes and Water Quality

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	Protect/acquire open space
Constructed wetlands	**Plant trees**	Restore upland revegetation
Restore depressional wetlands	**Rain gardens**	Restore buffer vegetation
Permeable pavement	**Vegetated filter strips**	
Bioretention cells and planters	**Disconnect downspouts**	
Bioretention swale		

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has 42% TIA; approximately 73% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has stream segments on the 303(d) list for exceeding fecal coliform, pH, and dissolved oxygen criteria.

Known Problems

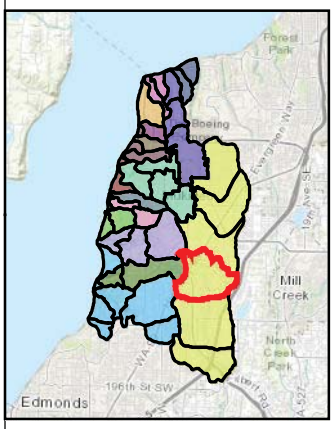
There are no known problems in this PAU.

Known Opportunities

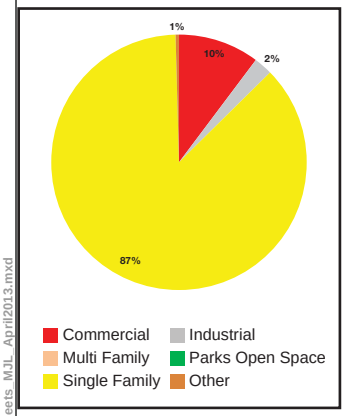
There are no known existing opportunities in this PAU.

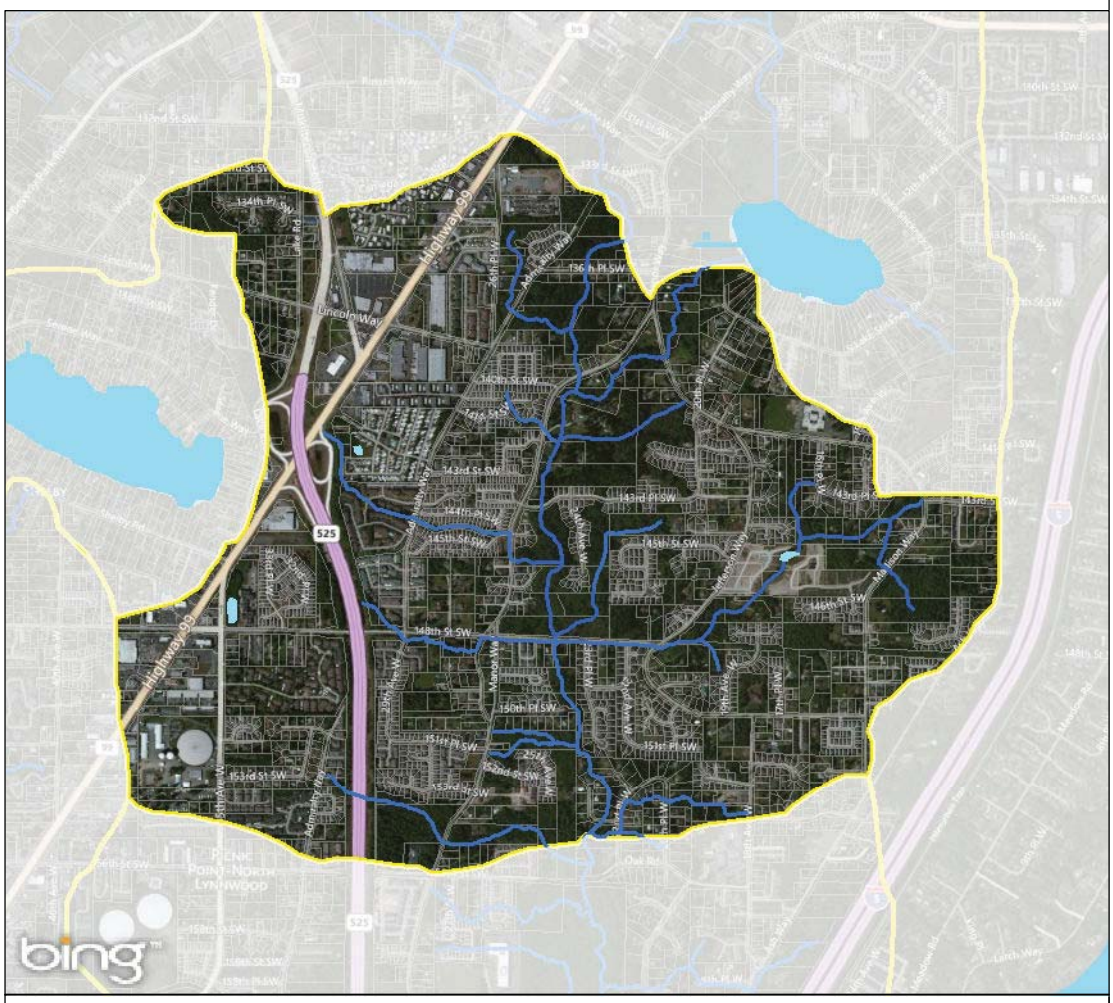
Swamp Creek E

Watershed: Swamp Creek
Management Category: Repair
Priority: Highest



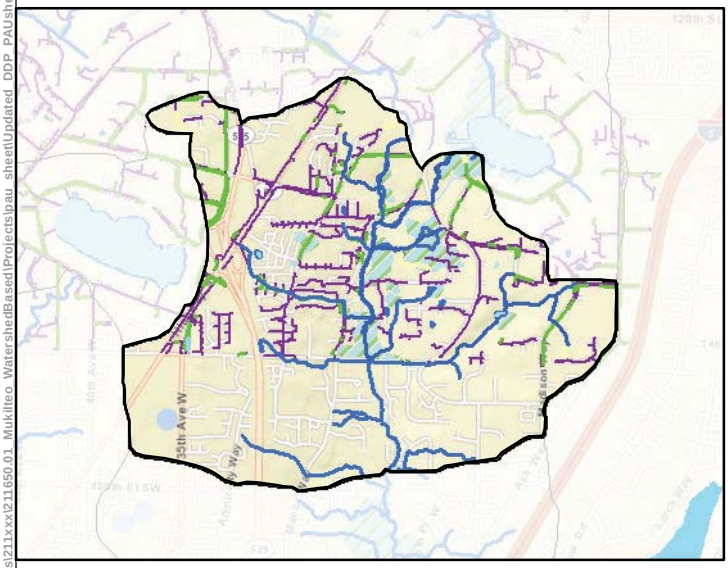
Area (acres): 1077
% Impervious: 43%
% Wetland: 3.9%
Landscape Position: Plateau



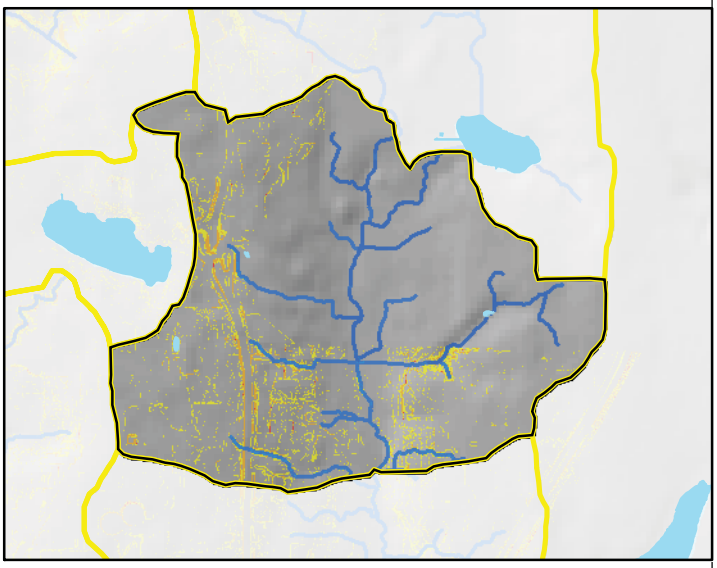


Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500
Feet



Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)



Steep Slopes Moderate Steep Very Steep

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Swamp Creek E

Key Watershed Processes

Delivery and recharge are both key processes within this PAU; with surface storage and discharge also being moderately important. Based on this analysis, surface storage, recharge, and discharge processes are relatively intact, but delivery processes are impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	moderate	moderate
Recharge	high	moderate
Discharge	moderate	moderate

Key Management Strategies

Primary Focus: Delivery and Recharge Processes and Water Quality

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	**Protect/acquire open space**
Constructed wetlands	**Plant trees**	**Restore upland revegetation**
Restore depressional wetlands	**Rain gardens**	**Restore buffer vegetation**
Permeable pavement	**Vegetated filter strips**	
Bioretention cells and planters	**Disconnect downspouts**	
Bioretention swale		

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has 43% TIA; approximately 83% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has stream segments on the 303(d) list for exceeding fecal coliform, pH, and dissolved oxygen criteria.

Known Problems

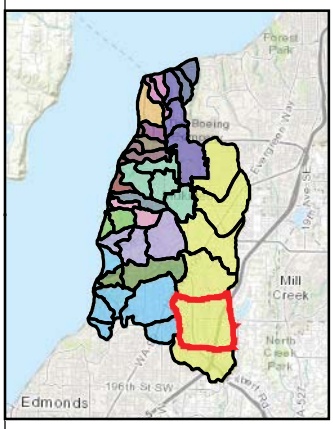
There are no known problems in this PAU.

Known Opportunities

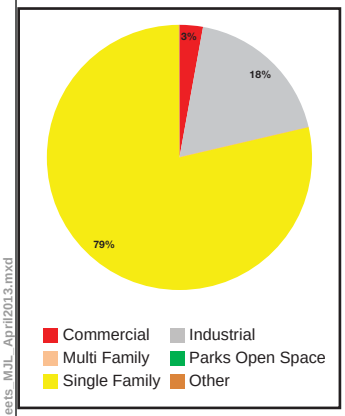
There are no known existing opportunities in this PAU.

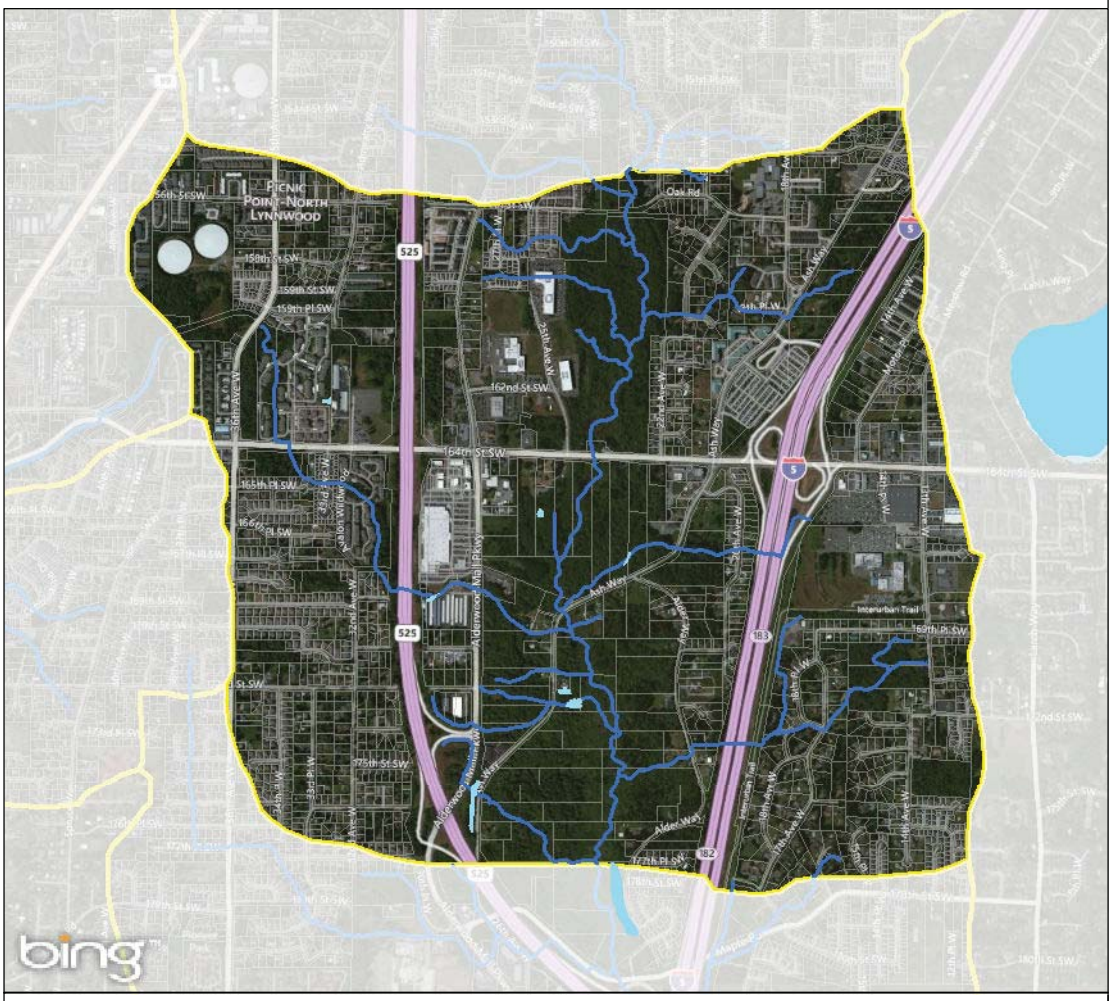
Swamp Creek F

Watershed: Swamp Creek
Management Category: Repair
Priority: Highest



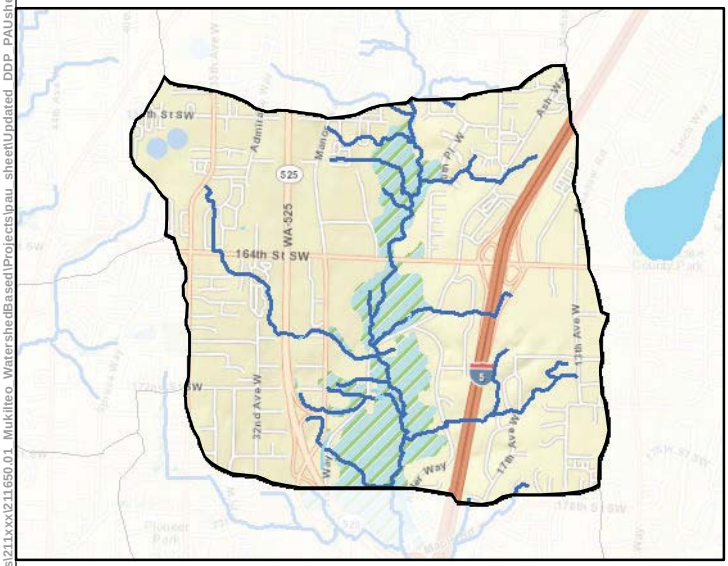
Area (acres): 1399
% Impervious: 35%
% Wetland: 9.0%
Landscape Position: Plateau

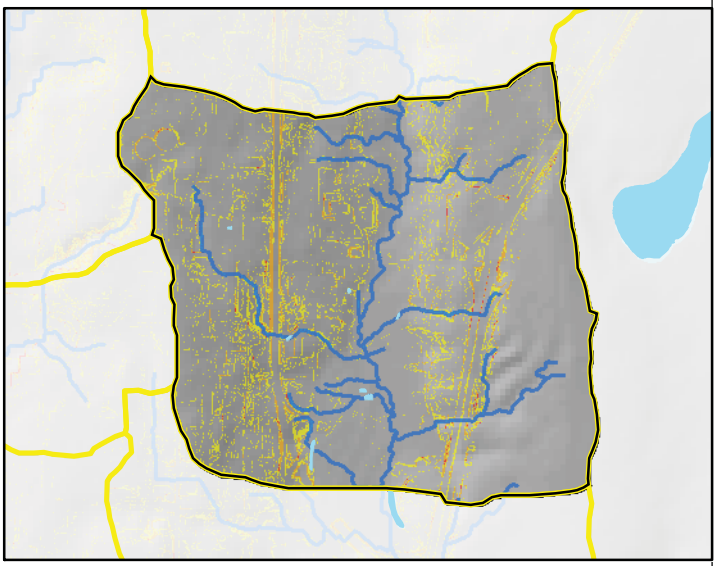




Streams
Waterbodies
Parcels
Parks

0 250 500 1,000 1,500 2,000 2,500 3,000 Feet





Drainage Streams Pipe Network Wetlands
Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Swamp Creek F

Key Watershed Processes

Delivery and recharge are both key processes within this PAU; with surface storage and discharge also being moderately important. Based on this analysis discharge processes are relatively intact, but delivery, recharge and surface storage processes are impaired.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	moderate	low
Recharge	high	moderate
Discharge	moderate	high

Key Management Strategies

Primary Focus: Delivery Process, Surface Storage, Recharge Processes, and Water Quality

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Detention/retention pond	**Soil amendment/restoration**	**Protect/acquire open space**
Constructed wetlands	**Plant trees**	**Restore upland revegetation**
Restore depressional wetlands	**Rain gardens**	**Restore buffer vegetation**
Permeable pavement	**Vegetated filter strips**	
Bioretention cells and planters	**Disconnect downspouts**	
Bioretention swale		

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has 35% TIA; approximately 78% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has stream segments on the 303(d) list for exceeding fecal coliform, pH, and dissolved oxygen criteria.

Known Problems

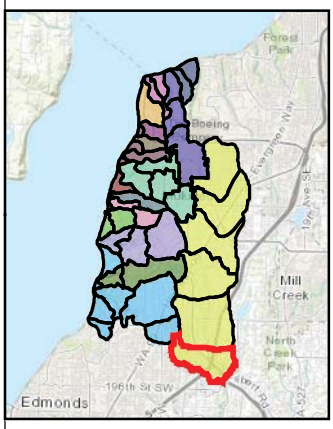
There are no known problems in this PAU.

Known Opportunities

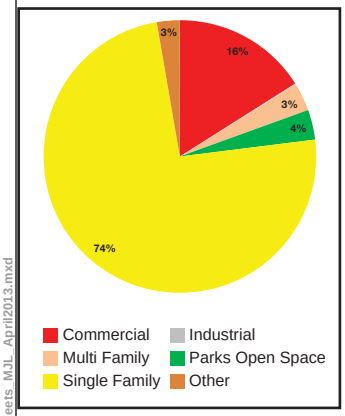
There are no known existing opportunities in this PAU.

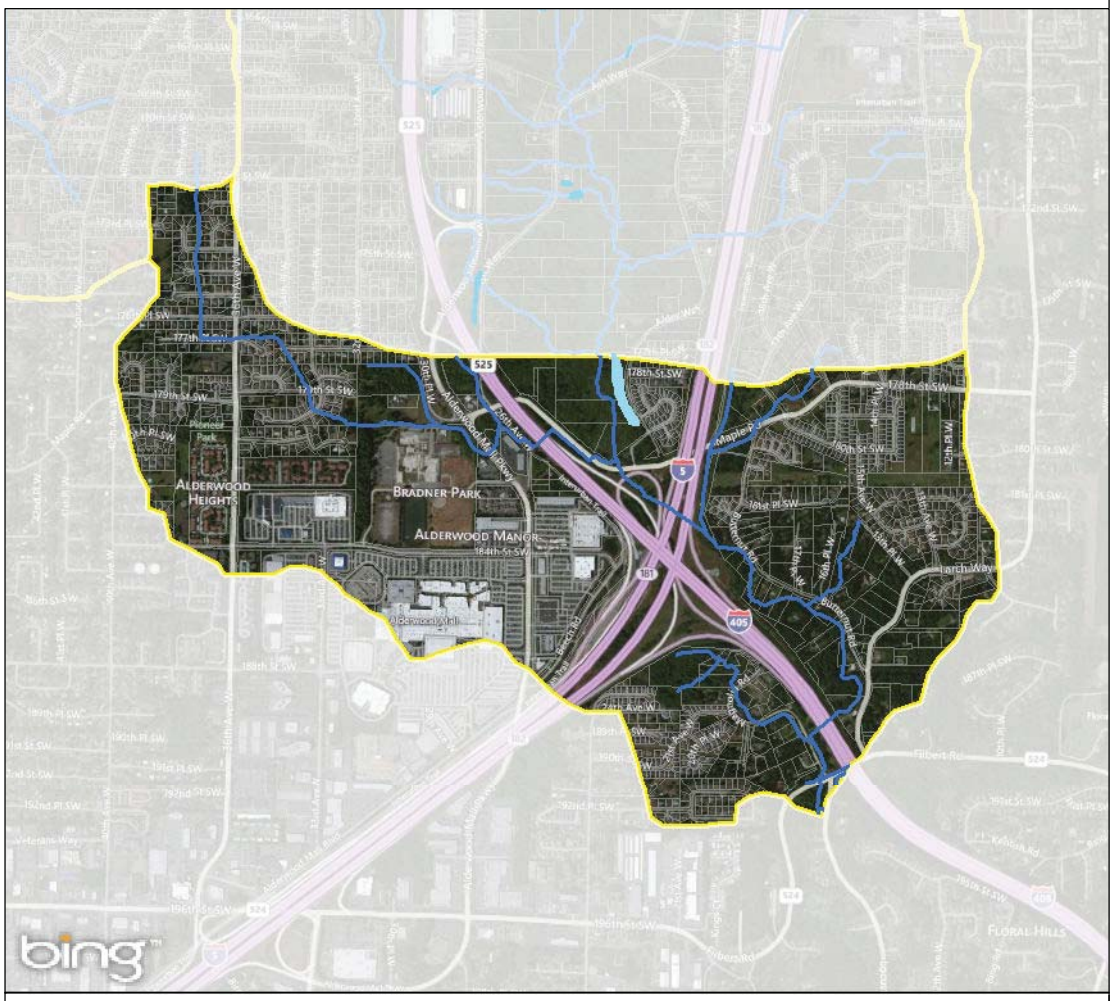
Swamp Creek G

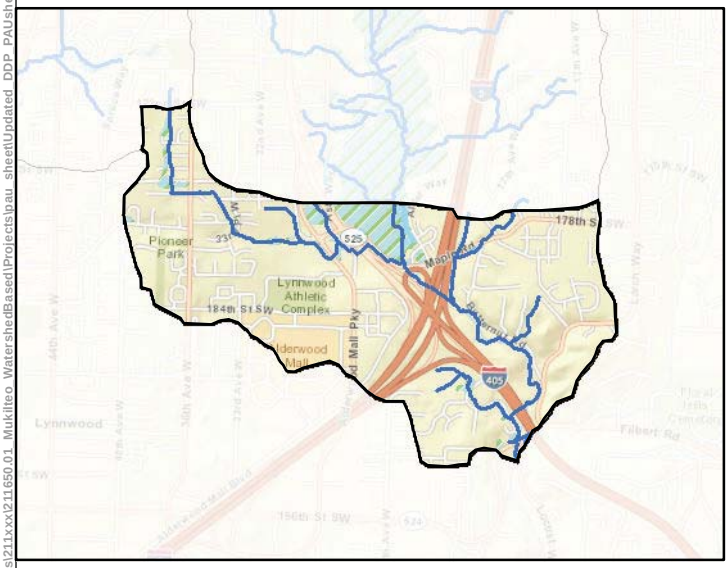
Watershed: Swamp Creek
Management Category: Repair
Priority: Highest

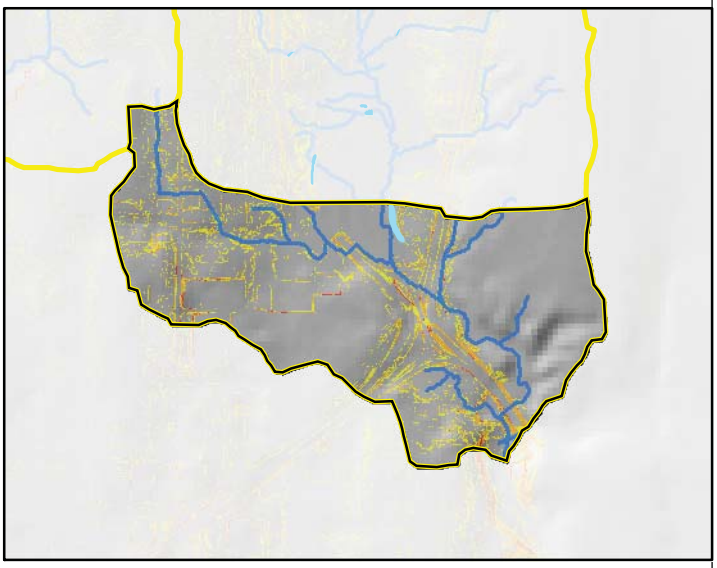


Area (acres): 798
% Impervious: 43%
% Wetland: 4.0%
Landscape Position: Plateau









Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Swamp Creek G

Key Watershed Processes

Delivery and recharge are both key processes within this PAU. Based on this analysis, both processes have been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	moderate
Recharge	high	moderate
Discharge	low	low

Key Management Strategies

Primary Focus: Delivery and Recharge Processes

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	**Protect/acquire open space**
Bioretention swale	**Plant trees**	**Restore upland revegetation**
Bioretention cells and planters	**Rain gardens**	**Restore buffer vegetation**
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

This PAU has 43% TIA; approximately 75% of the PAU is residential development; therefore on-site strategies may be most effective.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

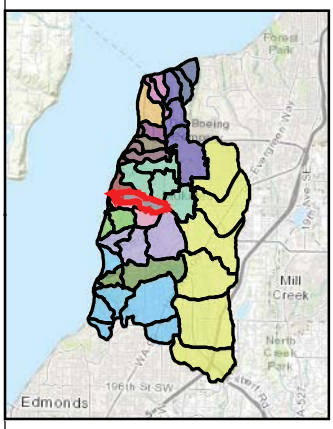
There are no known problems in this PAU.

Known Opportunities

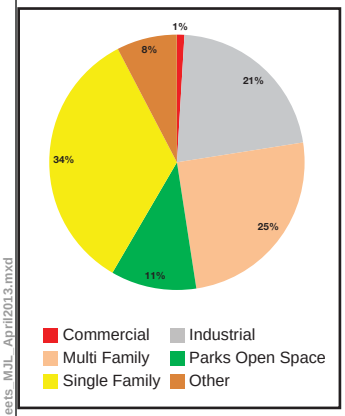
There are no known existing opportunities in this PAU.

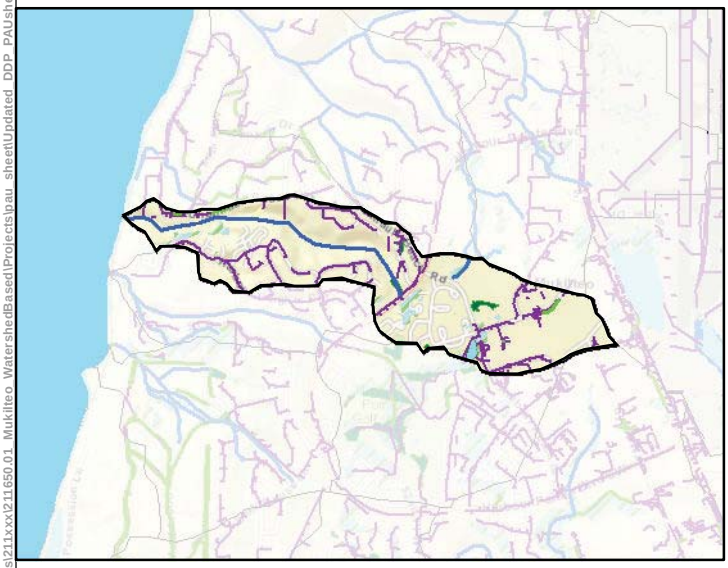
Upper Chennalut

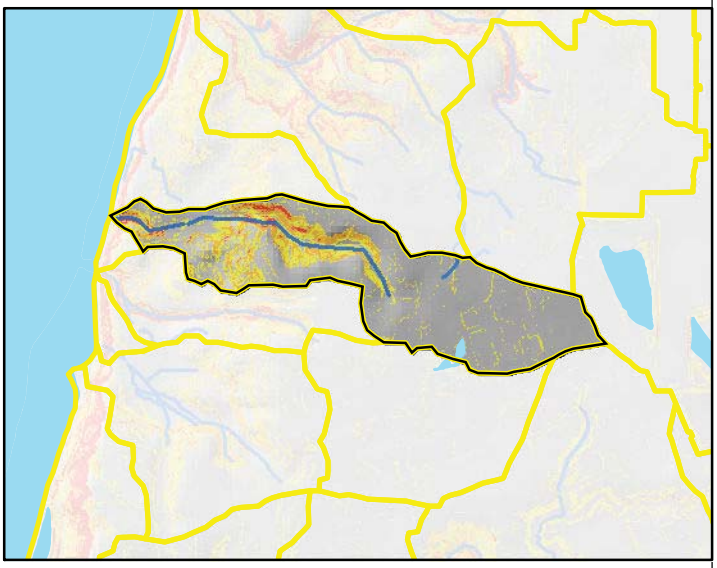
Watershed: Upper Chennault Beach Creek
Management Category: Targeted Management Strategies
Priority: Low



Area (acres): 278
% Impervious: 43%
% Wetland: 2.3%
Landscape Position: Ravine







Drainage Streams Pipe Network Wetlands Open Channel Systems Detention Ponds (Stormwater Facilities)

Steep Slopes Moderate Steep Very Steep

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Upper Chennault Beach Creek

Key Watershed Processes

Delivery is a key process within this PAU. Based on this analysis, the delivery process has been impaired by impervious surfaces.

WATERSHED PROCESS	IMPORTANCE	INTACTNESS
Delivery	high	low
Surface Storage	low	low
Recharge[1]	n/a	n/a
Discharge	low	high

[1]*Recharge was not evaluated for PAU's in ravine and bluff landscape positions*

Key Management Strategies

Primary Focus: Delivery Process

MUNICIPAL STRATEGIES	ON-SITE STRATEGIES	ADDITIONAL STRATEGIES
Permeable pavement	**Soil amendment/restoration**	Protect/acquire open space
Bioretention swale	**Plant trees**	Restore upland revegetation
	Rain gardens	Restore buffer vegetation
	Vegetated filter strips	
	Disconnect downspouts	

Bold font *indicates strategies most appropriate for this PAU*

Constraints/Existing Land Use

The lower portion of this PAU contains a steep ravine; use of strategies that infiltrate runoff will be limited/prohibited in these areas due to risks of landslides.

Water Quality

This PAU has no state impaired water quality listings.

Known Problems

High flows are causing stream bank failure and small landslides in the stream corridor.

Known Opportunities

There are no known existing opportunities in this PAU.